

TABLE 2

BIOLOGICAL ACTIVITY OF SCI MUTANTS

5	Mutant No.	Residue No.	Mutation	Size on Native Gel	AUC [mean]	Structure	Receptor Binding	% WT
	0		LD78	WT	160	Wt	1	100
10	1	48	Gln>Glu	Large?	400	Wt	2	
	2	44	Lys>Glu	Small	16	D	4	5
		45	Arg>Gln					
	5	17	Arg>Ser	Mixed	57.5	T/Do	2	25
	10	26	Asp>Ala	Small	35	T	1	77.4
15	11	12	Phe>Gln	Mixed	98	T/Do	1	34
	26	28	Phe>Glu	Small	16	D	4	1
		47	Arg>Glu					
	28	29	Glu>Arg	Small		T	2	7.7
	29	18	Gln>Glu	Small	130	Do	1	
20	30	17	Arg>Ser	Small	41	T	3	4.2
		18	Gln>Glu					
	35	-3	>Leu	WT	155	Wt	4	3
		-2	>Ser					
		-1	>Ala					
25		1	Ser>Pro					
		38	Gly>Ser					
		46	Ser>Gly					
	37	5	Asp>Ser	WT		Wt	1	45
	38	24	Ile>Ala	WT		Wt	1	50
30	40	29	Glu>Ser	WT			4	
	42	44	Lys>Ser	Small	45	T/Do	1	18
	43	45	Arg>Ser	Small	25	T	3	
	45	52	Asp>Ser	WT			4	
	48	60	Lys>Ser	WT			1	
35	52	66	Glu>Ser	Large	27	T	1	161.5
	54	1	Ser>Ala	WT			1	145
	60	8	Thr>Ala	WT			1	
	62	13	Ser>Ala	Large	370	Wt	1	66
	63	16	Ser>Ala	WT			3	
40	64	18	Gln>Ser	Large	200	Wt	4	
	66	27	Tyr>Ala	WT			2	47
	68	35	Ser>Ala	WT		Wt	1	125
	70	48	Gln>Ser	Mixed			2	

TABLE 2 (cont'd)

Mutant No.	Residue No.	Mutation	Size on Native Gel	AUC [mean]	Structure	Receptor Binding	% WT
71	53	Pro>Ala	WT			3	
75	67	Leu>Ala	WT			1	
77	12	Phe>Ala	Small	150		3	
79	15	Thr>Ala	Small	180		1	
82	22	Asn>Ser	WT			1	
84	25	Ala>Ser	WT			1	
85	28	Phe>Ala	WT			3	
87	31	Ser>Ala	WT			3	
94	42	Leu>Ala	WT			1	
97	51	Ala>Ser	Mixed			2	
101	26	Asp>Ala	WT			2	
	29	Glu>Arg					
102	26	Asp>Ala	Small			4	
	29	Glu>Arg					
	47	Arg>Glu					

KEY : AUC = Analytical Ultra Centrifugation (kDa)

Receptor Binding: 1 = Wild-type
 2 = 1/10 to 1/2 Wt
 3 = 1/100-1/10 Wt
 4 = Inactive

T = Tetramer

T/Do = Tetramer/Dodecamer equilibrium

D = Dimer

WT = Wild type

The following facts emerge from this analysis:

1) The majority of the variants with wild-type or minimally affected multimerisation properties exhibit wild-type or close to wild-type receptor binding.

2) There is a clear subset of variants which, though wild-type with respect to size, are clearly affected in their ability to compete with wild-type LD78 for receptor binding. The mutations in these variants presumably define the residues involved in interacting with the receptor. These key residues include Lys-44, Arg-45, Arg-17, Gln-18, Phe-28 and Glu-29.

3) Most of the de-multimerised variants appear to be compromised in receptor binding. This implies either that the residues involved in multimerisation are also involved in receptor binding, or that receptor binding requires a multimeric form of LD78. Wild-type receptor binding activity has not been seen in variants smaller than a tetramer. This is summarised in Figure 19. The numerals refer to the number of mutants found in each category. Mutants shown lying between the tetramer and dodecamer positions represent an equilibrium between the two states.

4) Variants in which the N terminus of LD78 are extended show greatly diminished ability to compete for receptor binding. Surprisingly, these include the forms of LD78 described previously such as in variant #35 (WO-A-9104274) and variant #34 (JP-A-03228683). In contrast, deletion of N-terminal residues appears to have minimal effect on receptor binding. The other N-terminal form described in the literature (Pragnell *et al.*, CRC Beatson Laboratories Scientific Report, Beatson Institute for Cancer Research, Glasgow, Scotland) does not express in the yeast expression systems described in this application.

5) The residues implicated in receptor binding map to two defined regions on the surface of the LD78 model described above. One region flanks the N-terminal serine and includes residues in the β -turn around residues 44-48 (Lys-Arg-Ser-Arg-Gln).

Taken together, these data suggest that the active form of LD78 is a tetramer. Figure 20 shows a view of the model of tetrameric LD78, showing the dramatic clustering of residues implicated in receptor binding. In this model of LD78 structure and function, mutations at the interface between dimers exert their effect on receptor binding indirectly, by disrupting the formation of the active, tetrameric species. A second implication of this model is that the N-terminal extended forms of LD78 are probably inactive proforms of the molecule, at least as regards the receptor present on A4 cells.

Both of these conclusions are surprising in view of the prior art. In WO-A-9104274 the N-termini of the LD78 forms they describe was not defined. The material was apparently biologically active, perhaps as a result of processing by proteases present in their *in vitro* assay of colony formation, or in view of the high concentrations of material used.

Although the active species of the SCI family of molecules has been a matter for speculation, it was recently asserted that for LD78 the active species is a monomer. (Mantel *et al.*, (1992), *loc. cit.*). This was based on the observation that *E.coli*-derived LD78, disaggregated in 30% acetonitrile & 0.1% TFA, was 1000-fold more active in various *in vitro* colony forming unit assays on the haematosis lineage precursors BFU-E and GM-CFC cells. We can only speculate that this large difference reflects a problem with the activity of the aggregated *E.coli* derived material.

Example 165 - Demultimerised mutants can inhibit the proliferation of haemopoietic progenitor cells (Day 12 CFU-S)

The ability of mutant #10 (Example 7) to inhibit the formation of murine day 12 CFU-S cell colonies was measured *in vitro* according to the following method. The activity was compared to that of mutant #82 (Example 94), which is wild-type with respect to structure and receptor binding.

Day 12 CFU-S cells were sorted from normal murine bone marrow cells as described in Lord and Spooncer (1986) *Lymphokine Research* 5:59-72. Sorted cells (between 500-1000) were plated in soft agar and assayed for their colony forming ability according to the method described in Heyworth and Spooncer (1992) in "Haemopoiesis - A Practical Approach" page 37 IRL Press (Testa and Molineux, Eds).

Growth factors were supplied from conditioned medium of L cells and AF1-19T cells. Each of the conditioned media was used at 10% as described in Pragnell *et al.*, (1988) *Blood* 72:196-201. LD78 mutant 10 or 82 was added at 150ng/ml, 15ng/ml, 1.5ng/ml or 0.15ng/ml to the top agar in 10 μ l of PBS and allowed to diffuse through the plate. The plates were then incubated at 37°C in 5% O₂, 5% CO₂ for 14 days. Colonies were counted with an inverted microscope. All assays were run in triplicate. 150ng/ml of LD78 wild type protein of Preparations 1 to 4 and PBS were used as controls in this experiment.

Results were expressed as a percentage of the control treated with carrier PBS alone. The Mutant 10 used in this assay will inhibit colony formation of day 12 CFU-S cells at concentrations down to 1.5ng/ml. Both mutant 10 (Figure 24) and 82 (Figure 25) show similar potency with optimum inhibitors at 15ng/ml. This shows that a demultimerised variant can exert functional effects as well as binding to the receptor.

Appendix A

Media recipes

5 BMGC

Quantities per litre:

	Sodium phosphate buffer 1M, pH6	- 100mL
10	Casamino acids (100g/L)	- 100mL
	Yeast Nitrogen Base (13.4 g/L)	- 100mL
	Biotin (0.2g/L)	- 2mL
	Glycerol	- 10mL

15 Filter sterilise

BMMC

As above but replace glycerol with 5mL of methanol.

20

YEPD

	Yeast extract	10g/L
	Peptone	20g/L
25	Glucose	10g/L

For solid medium add 15g/L agar

Autoclave at 121°C 15mins

YEPGlycerol

As above but replace glucose with glycerol

5 HCD

	$\text{H}_3\text{PO}_4(85\%)$	21mL/L
	$\text{CaSO}_4 \cdot \text{H}_2\text{O}$	0.9 g/L
	K_2SO_4	14.28g/L
10	$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$	11.7g/L
	KOH	3.9g/L
	Glycerol	50g/L

15 pH is about 1.7 when made up. Bring pH to 4 in the fermentor with ammonia solution (prior to sterilization). Sterilize in the fermentor and bring pH to 5.85 with ammonia solution prior to inoculation.

To the 3.5L of medium in the fermentor add 10mL of the following trace element solution (PTM₁)

20	$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$	6g/L
	KI	0.8g/L
	$\text{MnSO}_4 \cdot \text{H}_2\text{O}$	3.0g/L
	$\text{NaMoO}_4 \cdot 2\text{H}_2\text{O}$	0.2g/L
25	H_3BO_3	0.02g/L
	$\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$	0.5g/L
	ZnSO_4	20g/L
	H_2SO_4	5mL/L
	$\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$	65g/L
30	Biotin	0.2g/L

MD

	Yeast nitrogen base	13.4g/L
	Biotin	0.4g/L
5	Glucose	20g/L

Filter sterilise

For solid medium add 15g/L agar

10

Transformation buffers and reagentsSED

15	Sorbitol	1M
	EDTA (pH8)	25mM
	DTT	50mM (add just prior to use)

SCE

20

	Sorbitol	1M
	EDTA	1mM
	Sodium citrate buffer pH5.8	10mM

25

CAS

	Sorbitol	1M
	Tris-Cl pH7.5	10mM
	CaCl ₂	10mM

PEG solution

	PEG 3350	200g/L
	Tris-Cl pH7.5	10mM
5	CaCl ₂	10mM

Prepare fresh and filter sterilise. Discard if pH is below 7.

SOS

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	Sorbitol	1M
	YEPD	x0.3
	CaCl ₂	10mM

15

Regeneration medium (RD)

	Sorbitol	186g/L
	Agarose	10g/L
	Glucose	20g/L
20	Yeast nitrogen base	1.34g/L
	Biotin	400ug/L
	Histidine assay medium *	2g/L
	Glutamic acid	50mg/L
	Methionine	50mg/L
25	Lysine	50mg/L
	Leucine	50mg/L
	Isoleucine	50mg/L

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30 For base plates use agarose at 20g/L

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Wingfield *et al*, *Eur.J.Biochem.*, 173, 65-72, (1988).

Patent number AU-B-63882/86

Wolpe and Cerami, *FASEB, J.* 3 2565-2573 (1989)

Yphantis, *Biochemistry*, 3, 297-317, (1964)

SEQUENCE LISTING

(1) GENERAL INFORMATION:

5

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(i) APPLICANT:

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(E) COUNTRY: GB
(F) POSTAL CODE (ZIP): OX4 5LY

(ii) TITLE OF INVENTION: Stem Cell Inhibiting Proteins

(iii) NUMBER OF SEQUENCES: 178

(iv) COMPUTER READABLE FORM:

- (A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25

(EPO)

(vi) PRIOR APPLICATION DATA:

- (A) APPLICATION NUMBER: GB 9127319.3
(B) FILING DATE: 23-DEC-1991

(vi) PRIOR APPLICATION DATA:

- (A) APPLICATION NUMBER: GB 9221587.0
(B) FILING DATE: 14-OCT-1992

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 229 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(iii) ANTI-SENSE: NO

(ix) FEATURE:

(A) NAME/KEY: CDS

(B) LOCATION: 1..229

(D) OTHER INFORMATION: /codon_start= 1

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/product= "LD78 SYNTHETIC GENE"

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(A) NAME/KEY: 3'UTR

(B) LOCATION: 223..225

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(D) OTHER INFORMATION: /function= "NON-TRANSLATED STOP
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(ix) FEATURE:

(A) NAME/KEY: 3'UTR

(B) LOCATION: 226..228

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(D) OTHER INFORMATION: /function= "NON-TRANSLATED STOP
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AGC TTG GAT AAA AGA TCC TTG GCT GCT GAC ACT CCA ACC GCT TGT TGT

48

Ser Leu Asp Lys Arg Ser Leu Ala Ala Asp Thr Pro Thr Ala Cys Cys

25

1

5

10

15

TTC TCT TAC ACC TCT AGA CAA ATT CCA CAA AAT TTC ATT GCT GAC TAC

30

96

Phe Ser Tyr Thr Ser Arg Gln Ile Pro Gln Asn Phe Ile Ala Asp Tyr

20

25

30

35

TTT GAA ACT TCT TCT CAA TGT TCC AAG CCA GGT GTC ATC TTC TTG ACT

144

Phe Glu Thr Ser Ser Gln Cys Ser Lys Pro Gly Val Ile Phe Leu Thr

40

35

40

45

AAG CGC TCG AGA CAA GTC TGT GCT GAC CCA TCT GAA GAA TGG GTT CAA
192

5 Lys Arg Ser Arg Gln Val Cys Ala Asp Pro Ser Glu Glu Trp Val Gln

50

55

60

10 AAA TAT GTT TCT GAC TTG GAA TTG TCT GCC TAA TAA G
229

Lys Tyr Val Ser Asp Leu Glu Leu Ser Ala * *

65

70

75

15

(2) INFORMATION FOR SEQ ID NO:2:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 76 amino acids

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(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Ser Leu Asp Lys Arg Ser Leu Ala Ala Asp Thr Pro Thr Ala Cys Cys
1 5 10 15

30

Phe Ser Tyr Thr Ser Arg Gln Ile Pro Gln Asn Phe Ile Ala Asp Tyr
20 25 30

35

Phe Glu Thr Ser Ser Gln Cys Ser Lys Pro Gly Val Ile Phe Leu Thr
35 40 45

40

Lys Arg Ser Arg Gln Val Cys Ala Asp Pro Ser Glu Glu Trp Val Gln
50 55 60

Lys Tyr Val Ser Asp Leu Glu Leu Ser Ala * *
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5 (2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

- 10 (A) LENGTH: 229 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15 (iii) ANTI-SENSE: YES

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CTTATTAGGC AGACAATTCC AAGTCAGAAA CATATTTTTC AACCCATTCT TCAGATGGGT
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120

AAGAAGTTTC AAAGTAGTCA GCAATGAAAT TTTGTGGAAT TTGTCTAGAG GTGTAAGAGA
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AACAACAAGC GGTGGAGTG TCAGCAGCCA AGGATCTTTT ATCCAAGCT
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- (A) LENGTH: 45 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear
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(ii) MOLECULE TYPE: DNA

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(A) NAME/KEY: misc_feature

(B) LOCATION: 1..45

(D) OTHER INFORMATION: /product= "OLIGOMER FOR
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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

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(2) INFORMATION FOR SEQ ID NO:5:

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(A) LENGTH: 48 base pairs

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(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

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(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..48

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(D) OTHER INFORMATION: /product= "OLIGOMER FOR
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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

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AGAAACAACA AGCGGTGGA GTGTCAGCAG CCAAGGATCT TTTATCCA

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- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: DNA

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(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..50
- (D) OTHER INFORMATION: /product= "OLIGOMER FOR
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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

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(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 50 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: DNA

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- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..50
- (D) OTHER INFORMATION: /product= "OLIGOMER FOR
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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

TTCAAAGTAG TCAGCAATGA AATTTTGTGG AATTGTCTA GAGGTGTAAG
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(2) INFORMATION FOR SEQ ID NO:8:

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(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 48 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: DNA

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(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..48
- (D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF LD78 SYNTHETIC GENE"

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

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(2) INFORMATION FOR SEQ ID NO:9:

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- (A) LENGTH: 48 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..48

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(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF SYNTHETIC LD78 GENE"

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

GCGCTTAGTC AAGAAGATGA CACCTGGCTT GGAACATTGA GAAGAAGT
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(A) LENGTH: 46 base pairs
(B) TYPE: nucleic acid
15 (C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

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(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..46
(D) OTHER INFORMATION: /product= "OLIGOMER FOR THE
25 CONSTRUCTION OF LD78 SYNTHETIC GENE"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

30 TAAGCGCTCG AGACAAGTCT GTGCTGACCC ATCTGAAGAA TGGGTT
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(A) LENGTH: 46 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
40 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

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(A) NAME/KEY: misc_feature

(B) LOCATION: 1..46

(D) OTHER INFORMATION: /product= "OLIGOMER FOR
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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

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46

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(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 40 base pairs

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(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

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(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..40

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(D) OTHER INFORMATION: /product= "OLIGOMER FOR
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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

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CAAAAATATG TTTCTGACTT GGAATTGTCT GCCTAATAAG

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- (A) LENGTH: 37 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: DNA

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(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..37
- (D) OTHER INFORMATION: /product= "OLIGOMER FOR
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37

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(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

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GTTTCCCCAG TCANCGAC

18

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(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 7859 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

TTCCCATGTC TCTACTGGTG GTGGTGCTTC TTTGGAATTA TTGGAAGGTA AGGAATTGCC
60

AGGTGTTGCT TTCTTATCCG AAAAGAAATA AATTGAATTG AATTGAAATC GATAGATCAA
120

TTTTTTTCTT TTCTCTTTCC CCATCCTTTA CGCTAAAATA ATAGTTTATT TTATTTTTTG
180

AATATTTTTT ATTTATATAC GTATATATAG ACTATTATTT ACTTTTAATA GATTATTAAG
240

ATTTTTATTA AAAAAAATT CGTCCCTCTT TTTAATGCCT TTTATGCAGT TTTTTTTTCC
300

CATTCGATAT TTCTATGTTT GGGTTTCAGC GTATTTTAAG TTTAATAACT CGAAAATTCT
360

GCGTTTCGAA AAAGCTCTGC ATTAATGAAT CGGCCAACGC GCGGGGAGAG GCGGTTTGCG
420

TATTGGGCGC TCTTCCGCTT CCTCGCTCAC TGA CTCGCTG CGCTCGGTG TTCGGCTGCG
480

GCGAGCGGTA TCAGCTCACT CAAAGGCGGT AATACGGTTA TCCACAGAAT CAGGGGATAA
540

CGCAGGAAAG AACATGTGAG CAAAAGGCCA GCAAAGGCC AGGAACCGTA AAAAGGCCGC

600

GTTGCTGGCG TTTTCCATA GGCTCCGCCC CCCTGACGAG CATCACAAAA ATCGACGCTC
660

5

AAGTCAGAGG TGGCGAAACC CGACAGGACT ATAAAGATAC CAGGCGTTTC CCCCTGGAAG
720

10

CTCCCTCGTG CGCTCTCCTG TTCCGACCCT GCCGCTTACC GGATACCTGT CCGCCTTTCT
780

CCCTTCGGGA AGCGTGGCGC TTTCTCATAG CTCACGCTGT AGGTATCTCA GTTCGGTGTA
840

15

GGTCGTTGCG TCCAAGCTGG GCTGTGTGCA CGAACCCCCC GTTCAGCCCG ACCGCTGCGC
900

CTTATCCGGT AACTATCGTC TTGAGTCAA CCCGGTAAGA CACGACTTAT CGCCACTGGC
960

20

AGCAGCCACT GGTAACAGGA TTAGCAGAGC GAGGTATGTA GGCGGTGCTA CAGAGTTCTT
1020

25

GAAGTGGTGG CCTAACTACG GCTACACTAG AAGGACAGTA TTTGGTATCT GCGCTCTGCT
1080

GAAGCCAGTT ACCTTCGGAA AAAGAGTTGG TAGCTCTTGA TCCGGCAAAC AAACCACCGC
1140

30

TGGTAGCGGT GGTTTTTTTG TTTGCAAGCA GCAGATTACG CGCAGAAAAA AAGGATCTCA
1200

AGAAGATCCT TTGATCTTTT CTACGGGGTC TGACGCTCAG TGGAACGAAA ACTCACGTTA
1260

35

AGGGATTTTG GTCATGAGAT TATCAAAAAG GATCTTCACC TAGATCCTTT TAAATTAAAA
1320

40

ATGAAGTTTT AAATCAATCT AAAGTATATA TGAGTAAACT TGGTCTGACA GTTACCAATG
1380

CTTAATCAGT GAGGCACCTA TCTCAGCGAT CTGTCTATTT CGTTCATCCA TAGTTGCCTG
1440

5 ACTCCCCGTC GTGTAGATAA CTACGATACG GGAGGGCTTA CCATCTGGCC CCAGTGCTGC
1500

AATGATACCG CGAGACCCAC GCTCACC GGC TCCAGATTTA TCAGCAATAA ACCAGCCAGC
1560

10 CGGAAGGGCC GAGCGCAGAA GTGGTCCTGC AACTTTATCC GCCTCCATCC AGTCTATTAA
1620

TTGTTGCCGG GAAGCTAGAG TAAGTAGTTC GCCAGTTAAT AGTTGCGCA ACGTTGTTGC
1680

15 CATTGCTACA GGCATCGTGG TGTCACGCTC GTCGTTTGGT ATGGCTTCAT TCAGCTCCGG
1740

TTCCCAACGA TCAAGGCGAG TTACATGATC CCCCATGTTG TGCAAAAAAG CGGTTAGCTC
1800

CTTCGGTCCT CCGATCGTTG TCAGAAGTAA GTTGGCCGCA GTGTTATCAC TCATGGTTAT
1860

25 GGCAGCACTG CATAATTCTC TTACTGTCAT GCCATCCGTA AGATGCTTTT CTGTGACTGG
1920

TGAGTACTCA ACCAAGTCAT TCTGAGAATA GTGTATGCGG CGACCGAGTT GCTCTTGCCC
1980

30 GGCGTCAACA CGGGATAATA CCGCGCCACA TAGCAGAACT TTAAAAGTGC TCATCATTGG
2040

AAAACGTTCT TCGGGGCGAA AACTCTCAAG GATCTTACCG CTGTTGAGAT CCAGTTCGAT
2100

35 GTAACCCACT CGTGCACCCA ACTGATCTTC AGCATCTTTT ACTTTCACCA GCGTTTCTGG
2160

40 GTGAGCAAAA ACAGGAAGGC AAAATGCCGC AAAAAAGGGA ATAAGGGCGA CACGGAAATG

2220

TTGAATACTC ATACTCTTCC TTTTCAATA TTATTGAAGC ATTTATCAGG GTTATTGTCT
2280

5 CATGAGCGGA TACATATTG AATGTATTTA GAAAAATAAA CAAATAGGGG TTCCGCGCAC
2340

10 ATTTCCCCGA AAAGTGCCAC CTGACGTCTA AGAAACCATT ATTATCATGA CATTAACCTA
2400

TAAAAATAGG CGTATCACGA GGCCCTTTCG TCTTCAAGAA TTCTGAACCA GTCCTAAAC
2460

15 GAGTAAATAG GACCGGCAAT TCTTCAAGCA ATAAACAGGA ATACCAATTA TTAAAAGATA
2520

ACTTAGTCAG ATCGTACAAT AAAGCTAGCT TTGAAGAAAA ATGCGCCTTA TTCAATCTTT
2580

20 GCTATAAAAA ATGGCCCAAA ATCTCACATT GGAAGACATT TGATGACCTC ATTTCTTTCA
2640

ATGAAGGGCC TAACGGAGTT GACTAATGTT GTGGGAAATT GGAGCGATAA GCGTGCTTCT
2700

25 GCCGTGGCCA GGACAACGTA TACTCATCAG ATACAGCAA TACCTGATCA CTACTTCGCA
2760

30 CTAGTTTCTC GGTACTATGC ATATGATCCA ATATCAAAGG AAATGATAGC ATTGAAGGAT
2820

GAGACTAATC CAATTGAGGA GTGGCAGCAT ATAGAACAGC TAAAGGGTAG TGCTGAAGGA
2880

35 AGCATACGAT ACCCCGCATG GAATGGGATA ATATCACAGG AGGTACTAGA CTACCTTTCA
2940

40 TCCTACATAA ATAGACGCAT ATAAGTACGC ATTTAAGCAT AAACACGCAC TATGCCGTTC
3000

TTCTCATGTA TATATATATA CAGGCAACAC GCAGATATAG GTGCGACGTG AACAGTGAGC
3060

5 TGTATGTGCG CAGCTCGCGT TGCATTTTCG GAAGCGCTCG TTTTCGGAAA CGCTTTGAAG
3120

TTCCTATTCC GAAGTTCCTA TTCTCTAGAA AGTATAGGAA CTTCAGAGCG CTTTTGAAAA
3180

10 CCAAAGCGC TCTGAAGACG CACTTTCAAA AAACCAAAAA CGCACCGGAC TGTAACGAGC
3240

TACTAAAATA TTGCGAATAC CGCTTCCACA AACATTGCTC AAAAGTATCT CTTTGCTATA
3300

15 TATCTCTGTG CTATATCCCT ATATAACCTA CCCATCCACC TTTCGCTCCT TGAAC TTGCA
3360

TCTAAACTCG ACCTCTACAT TTTTATGTT TATCTCTAGT ATTACTCTTT AGACAAAAAA
20 3420

ATTGTAGTAA GAACTATTCA TAGAGTGAAT CGAAAACAAT ACGAAAATGT AAACATTTCC
3480

25 TATACGTAGT ATATAGAGAC AAAATAGAAG AAACCGTTCA TAATTTTCTG ACCAATGAAG
3540

AATCATCAAC GCTATCACTT TCTGTTTACA AAGTATGCGC AATCCACATC GGTATAGAAT
3600

30 ATAATCGGGG ATGCCTTTAT CTTGAAAAAA TGCACCCGCA GCTTCGCTAG TAATCAGTAA
3660

ACGCGGGAAG TGGAGTCAGG CTTTTTTTAT GGAAGAGAAA ATAGACACCA AAGTAGCCTT
35 3720

CTTCTAACCT TAACGGACCT ACAGTGCAAA AAGTTATCAA GAGACTGCAT TATAGAGCGC
3780

40 ACAAAGGAGA AAAAAAGTAA TCTAAGATGC TTTGTTAGAA AAATAGCGCT CTCGGGATGC

3840
ATTTTGTAG AACAAAAAG AAGTATAGAT TCTTTGTTGG TAAAATAGCG CTCTCGCGTT
3900
5 GCATTTCTGT TCTGTAAAAA TGCAGCTCAG ATTCTTTGTT TGAAAAATTA GCGCTCTCGC
3960
GTTGCATTTT TGTTTTACAA AAATGAAGCA CAGATTCTTC GTTGGTAAAA TAGCGCTTTC
10 4020
GCGTTGCATT TCTGTTCTGT AAAAATGCAG CTCAGATTCT TTGTTTGAAA AATTAGCGCT
4080
15 CTCGCGTTGC ATTTTGTTC TACAAAATGA AGCACAGATG CTTCGTTAAC AAAGATATGC
4140
TATTGAAGTG CAAGATGGAA ACGCAGAAAA TGAACCGGGG ATGCGACGTG CAAGATTACC
4200
20 TATGCAATAG ATGCAATAGT TTCTCCAGGA ACCGAAATAC ATACATTGTC TTCCGTAAAG
4260
CGCTAGACTA TATATTATTA TACAGGTTCA AATATACTAT CTGTTTCAGG GAAAACTCCC
25 4320
AGGTTCCGAT GTTCAAATT CAATGATGGG TAACAAGTAC GATCGTAAAT CTGTAAAACA
4380
30 GTTTGTCGGA TATTAGGCTG TATCTCCTCA AAGCGTATTC GAATATCATT GAGAAGCTGC
4440
ATTTTTTTTT TTTTATAT ATATTCAAG GATATACCAT TGTAATGCCT GCCCCTAAGA
4500
35 AGATCGTCGT TTGCCAGGT GACCACGTTG GTCAAGAAAT CACAGCCGAA GCCATTAAGG
4560
TTCTTAAAGC TATTCTGAT GTTCGTTCCA ATGTCAAGTT CGATTTCGAA AATCATTTAA
40 4620

TTGGTGGTGC TGCTATCGAT GCTACAGGTG TTCCACTTCC AGATGAGGCG CTGGAAGCCT
4680

5 CCAAGAAGGC TGATGCCGTT TTGTTAGGTG CTGTGGGTGG TCCTAAATGG GGTACCGGTA
4740

GTGTTAGACC TGAACAAGGT TTACTAAAAA TCCGTAAAGA ACTTCAATTG TACGCCAACT
4800

10 TAAGACCATG TAACTTTGCA TCCGACTCTC TTTTAGACTT ATCTCCAATC AAGCCACAAT
4860

TTGCTAAAGG TACTGACTTC GTTGTGTGTA GAGAATTAGT GGGAGGTATT TACTTTGGTA
4920

15 AGAGAAAGGA AGACGATGGT GATGGTGTCG CTTGGGATAG TGAACAATAC ACCGTTCCAG
4980

AAGTGCAAAG AATCACAAGA ATGGCCGCTT TCATGGCCCT ACAACATGAG CCACCATTGC
5040

20 CTATTTGGTC CTTGGATAAA GCTAATGTTT TGGCCTCTTC AAGATTATGG AGAAAACTG
5100

25 TGGAGGAAAC CATCAAGAAC GAATTCCCTA CATTGAAAGT TCAACATCAA TTGATTGATT
5160

CTGCCGCCAT GATCCTAGTT AAGAACCCAA CCCACCTAAA TGGTATTATA ATCACCAGCA
5220

30 ACATGTTTGG TGATATCATC TCCGATGAAG CCTCCGTTAT CCCAGGCTCC TTGGGTTTGT
5280

TGCCATCTGC GTCCTTGGCC TCTTTGCCAG ACAAGAACAC CGCATTGTTG TTGTACGAAC
5340

35 CATGCCATGG TTCCGCTCCA GATTGCCAA AGAATAAGGT CAACCCTATC GCCACTATCT
5400

40 TGTCTGCTGC AATGATGTTG AAATTGTCAT TGAAGTGGC TGAAGAAGGT AAAGCCATTG

5460

AAGATGCAGT TAAAAAGGTT TTGGATGCAG GTATCAGAAC TGGTGATTTA GGTGGTTCCA
5520

5

ACAGTACCAC CGAAGTCGGT GATGCTGTCG CCGAAGAAGT TAAGAAAATC CTTGCTTAAA
5580

10

AAGATTCTCT TTTTTTATGA TATTTGTACA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA
5640

AAAAAAAAAA AAAAAAAAAA AAAATGCAGC GTCACATCGG ATAATAATGA TGGCAGCCAT
5700

15

TGTAGAAGTG CCTTTTGCAT TTCTAGTCTC TTTCTCGGTC TAGCTAGTTT TACTACATCG
5760

CGAAGATAGA ATCTTAGATC AACTGCCTT TGCTGAGCTG GATCAATAGA GTAACAAAAG
5820

20

AGTGGTAAGG CCTCGTTAAA GGACAAGGAC CTGAGCGGAA GTGTATCGTA CAGTAGACGG
5880

25

AGTATACTAG TATAGTCTAT AGTCCGTGGA ATTCTCATGT TTGACAGCTT ATCATCGATA
5940

AGCTAGCTTT CTAAGTATC TATCCAAAAC TGAAAATTAC ATTCTTGATT AGGTTTATCA
6000

30

CAGGCAAATG TAATTTGTGG TATTTTGCCG TTCAAATCT GTAGAATTTT CTCATTGGTC
6060

ACATTACAAC CTGAAAATAC TTTATCTACA ATCATACCAT TCTTAATAAC ATGTCCCCTT
6120

35

AATACTAGGA TCAGGCATGA ACGCATCACA GACAAAATCT TCTTGACAAA CGTCACAATT
6180

40

GATCCCTCCC CATCCGTTAT CACAATGACA GGTGTCATTT TGTGCTCTTA TGGGACGATC
6240

CTTATTACCG CTTTCATCCG GTGATTGACC GCCACAGAGG GGCAGAGAGC AATCATCACC
6300

5 TGCAAACCCT TCTATACACT CACATCTACC AGTGATCGAA TTGCATTAG AAAACTGTTT
6360

GCATTCAAAA ATAGGTAGCA TACAATTAAA ACATGGCGGG CATGTATCAT TGCCCTTATC
6420

10 TTGTGCAGTT AGACGCGAAT TTTTCGAAGA AGTACCTTCA AAGAATGGGG TCTTATCTTG
6480

TTTTGCAAGT ACCACTGAGC AGGATAATAA TAGAAATGAT AATATACTAT AGTAGAGATA
6540

15 ACGTCGATGA CTTCCCATAC TGTAATTGCT TTTAGTTGTG TATTTTTAGT GTGCAAGTTT
6600

20 CTGTAAATCG ATTAATTTTT TTTTCTTTCC TCTTTTTATT AACCTTAATT TTTATTTTAG
6660

ATTCCTGACT TCAACTCAAG ACGCACAGAT ATTATAACAT CTGCATAATA GGCATTGCA
6720

25 AGAATTACTC GTGAGTAAGG AAAGAGTGAG GAACTATCGC ATACCTGCAT TTAAAGATGC
6780

CGATTTGGGC GCGAATCCTT TATTTTGGCT TCACCCTCAT ACTATTATCA GGGCCAGAAA
6840

30 AAGGAAGTGT TTCCCTCCTT CTTGAATTGA TGTTACCCTC ATAAAGCACG TGGCCTCTTA
6900

TCGAGAAAGA AATTACCGTC GCTCGTGATT TGTTTGCAA AAGAACAAAA CTGAAAAAAC
6960

CCAGACACGC TCGACTTCCT GTCTTCCTAT TGATTGCAGC TTCCAATTTT GTCACACAAC
7020

40 AAGGTCCTAG CGACGGCTCA CAGGTTTTGT AACAAGCAAT CGAAGGTTCT GGAATGGCGG

7080

GGAAAGGGTT TAGTACCACA TGCTATGATG CCCACTGTGA TCTCCAGAGC AAAGTTCGTT
7140

5

CGATCGTACT GTACTCTCTC TCTTTCAAAC AGAATTGTCC GAATCGTGTG ACAACAACAG
7200

10

CCTGTTCTCA CACACTCTTT TCTTCTAACC AAGGGGGTGG TTTAGTTTAG TAGAACCTCG
7260

TGAAACTTAC ATTTACATAT ATATAAACTT GCATAAATTG GTCAATGGAA GAAATACATA
7320

15

TTTGGTCTTT TCTAATTCGT AGTTTTTCAA GTTCTTAGAT GCTTCTTTT TCTCTTTTTT
7380

ACAGATCATC AAGGAAGTAA TTATCTACTT TTTACAACAA ATACAAAAGA TCTATGAGAT
7440

20

TTCCTTCAAT TTTTACTGCA GTTTTATTCTG CAGCATCCTC CGCATTAGCT GCTCCAGTCA
7500

25

ACACTACAAC AGAAGATGAA ACGGCACAAA TTCCGGCTGA AGCTGTCATC GGTTACTTAG
7560

ATTTAGAAGG GGATTTGAT GTTGCTGTTT TGCCATTTTC CAACAGCACA AATAACGGGT
7620

30

TATTGTTTAT AAATACTACT ATTGCCAGCA TTGCTGCTAA AGAAGAAGGG GTAAGCTTGG
7680

ATAAAAGAAA CAGCGACTCT GAATGCCCGC TGAGCCATGA TGGCTACTGC CTGCACGACG
7740

35

GTGTATGCAT GTATATCGAA GCTCTGGACA AATACGCATG CAACTGCGTA GTTGGTTACA
7800

40

TCGGCGAACG TTGCCAGTAC CGCGACCTGA AATGGTGGGA GCTCCGTAA TAAGGATCC
7859

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

AGGATGGGGA AAGAGAA

17

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 234 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(iii) ANTI-SENSE: NO

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..234
- (D) OTHER INFORMATION: /codon_start= 1
/product= "MIP-1-ALPHA GENE"

(ix) FEATURE:

- (A) NAME/KEY: 3'UTR
- (B) LOCATION: 223..225
- (D) OTHER INFORMATION: /function= "UNTRANSLATED STOP"

CODON"

(ix) FEATURE:

- 5 (A) NAME/KEY: 3'UTR
 (B) LOCATION: 226..228
 (D) OTHER INFORMATION: /function= "NON-TRANSLATED STOP
 CODON"

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

AGC TTA CCT GCC ATG GCG CCT TAT GGA GCT GAC ACC CCG ACT GCA TGC
 48
 Ser Leu Pro Ala Met Ala Pro Tyr Gly Ala Asp Thr Pro Thr Ala Cys
 15 1 5 10 15

TGC TTC TCC TAC AGC CGG AAG ATT CCA CGC CAA TTC ATC GTC GAC TAT
 20 96
 Cys Phe Ser Tyr Ser Arg Lys Ile Pro Arg Gln Phe Ile Val Asp Tyr
 20 25 30

TTT GAA ACT AGT AGC CTT TGC TCC CAG CCA GGT GTC ATT TTC CTG ACT
 25 144
 Phe Glu Thr Ser Ser Leu Cys Ser Gln Pro Gly Val Ile Phe Leu Thr
 30 35 40 45

AAG AGA AAC CGG CAG ATC TGC GCT GAC TCC AAA GAG ACC TGG GTC CAA
 192
 Lys Arg Asn Arg Gln Ile Cys Ala Asp Ser Lys Glu Thr Trp Val Gln
 50 55 60

GAA TAC ATC ACT GAC CTC GAG CTG AAT GCC TGA TAG GAT CCG
 40

234

Glu Tyr Ile Thr Asp Leu Glu Leu Asn Ala * * Asp Pro
 65 70 75

5

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 78 amino acids
 (B) TYPE: amino acid
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

15

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Ser Leu Pro Ala Met Ala Pro Tyr Gly Ala Asp Thr Pro Thr Ala Cys
 1 5 10 15

20

Cys Phe Ser Tyr Ser Arg Lys Ile Pro Arg Gln Phe Ile Val Asp Tyr
 20 25 30

25

Phe Glu Thr Ser Ser Leu Cys Ser Gln Pro Gly Val Ile Phe Leu Thr
 35 40 45

30

Lys Arg Asn Arg Gln Ile Cys Ala Asp Ser Lys Glu Thr Trp Val Gln
 50 55 60

35

Glu Tyr Ile Thr Asp Leu Glu Leu Asn Ala * * Asp Pro
 65 70 75

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

40

(A) LENGTH: 234 base pairs
 (B) TYPE: nucleic acid

(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(iii) ANTI-SENSE: YES

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

CGGATCCTAT CAGGCATTCA GCTCGAGGTC AGTGATGTAT TCTTGGACCC AGGTCTCTTT
60

GGAGTCAGCG CAGATCTGCC GGTTCCTCTT AGTCAGGAAA ATGACACCTG GCTGGGAGCA
120

AAGGCTACTA GTTTCAAAAT AGTCGACGAT GAATTGGCGT GGAATCTTCC GGCTGTAGGA
180

GAAGCAGCAT GCAGTCGGGG TGTCAGCTCC ATAAGGCGCC ATGGCAGGTA AGCT
234

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 38 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..38

(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF MIP-ALPHA GENE"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

AGCTTACCTG CCATGGCGCC TTATGGAGCT GACACCCC

38

5

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 41 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..41

20

(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCITON OF MIP1-ALPHA GENE"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

25

TGCAGTCGGG GTGTCAGCTC CATAAGGCGC CATGGCAGGT A

41

(2) INFORMATION FOR SEQ ID NO:22:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 44 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

35

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

(A) NAME/KEY: misc_feature
 (B) LOCATION: 1..44
 (D) OTHER INFORMATION: /product= "OLIGOMER FOR
 CONSTRUCTION OF MIP1-ALPHA GENE"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

GACTGCATGC TGCTTCTCCT ACAGCCGGAA GATTCCACGC CAAT
 44

10

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:

15

(A) LENGTH: 44 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

25

(A) NAME/KEY: misc_feature
 (B) LOCATION: 1..43
 (D) OTHER INFORMATION: /product= "OLIGOMER FOR
 CONSTRUCTION OF MIP1-ALPHA GENE"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

ACGATGAATT GCGTGGAAT CTTCCGGCTG TAGGAGAAGC AGCA
 44

35

(2) INFORMATION FOR SEQ ID NO:24:

(i) SEQUENCE CHARACTERISTICS:

40

(A) LENGTH: 39 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

5

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..39

10

(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF MIP1-ALPHA GENE"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

15

TCATCGTCGA CTATTTTGAA ACTAGTAGCC TTTGCTCCC
39

(2) INFORMATION FOR SEQ ID NO:25:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 39 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

25

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

30

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..39

(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF MIP1-ALPHA GENE"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

CCTGGCTGGG AGCAAAGGCT ACTAGTTTCA AAATAGTCG
39

40

(2) INFORMATION FOR SEQ ID NO:26:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 37 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

10

(ix) FEATURE:

- 15 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..37
(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF MIP1-ALPHA GENE"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

20

AGCCAGGTGT CATTTTCCTG ACTAAGAGAA ACCGGCA
37

(2) INFORMATION FOR SEQ ID NO:27:

25

(i) SEQUENCE CHARACTERISTICS:

- 30 (A) LENGTH: 37 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

- 40 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..37
(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF MIP1-ALPHA GENE"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

GCAGATCTGC CGGTTTCTCT TAGTCAGGAA AATGACA
37

5

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- 10 (A) LENGTH: 44 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

- 20 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..44
(D) OTHER INFORMATION: /product= "OLIGOMER FOR THE
CONSTRUCTION OF MIPI-ALPHA GENE"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

25

GATCTGCGCT GACTCCAAAG AGACCTGGGT CCAAGAATAC ATCA
44

(2) INFORMATION FOR SEQ ID NO:29:

30

(i) SEQUENCE CHARACTERISTICS:

- 35 (A) LENGTH: 44 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..44
(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF MIP1-ALPHA GENE"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

AGGTCAGTGA TGTATTCTTG GACCCAGGTC TCTTTGGAGT CAGC

10

44

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:

15

(A) LENGTH: 32 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

25

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..32
(D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF MIP1-ALPHA SYNTHETIC GENE"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

CTGACCTCGA GCTGAATGCC TGATAGGATC CG

32

35

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:

40

(A) LENGTH: 29 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

5

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..29

10 (D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF MIP1-ALPHA GENE"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

15 AATTCGGATC CTATCAGGCA TTCAGCTCG
29

(2) INFORMATION FOR SEQ ID NO:32:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 15 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

25

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

30

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..15

(D) OTHER INFORMATION: /product= "TOP STRAND OF
OLIGONUCLEOTIDE ADAPTOR"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

AGCTTGGATA AAAGA

15

40

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 11 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

10

(ix) FEATURE:

- 15 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..11
(D) OTHER INFORMATION: /product= "BOTTOM STRAND OF
OLIGONUCLEOTIDE ADAPTOR"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

20

TCTTTTATCC A

11

(2) INFORMATION FOR SEQ ID NO:34:

25

(i) SEQUENCE CHARACTERISTICS:

- 30 (A) LENGTH: 229 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(iii) ANTI-SENSE: NO

35

(ix) FEATURE:

- 40 (A) NAME/KEY: CDS
(B) LOCATION: 1..228
(D) OTHER INFORMATION: /codon_start= 1

/product= "HUMAN ACT-2 SYNTHETIC GENE"

(ix) FEATURE:

5 (A) NAME/KEY: 3'UTR
(B) LOCATION: 223..225
(D) OTHER INFORMATION: /function= "NON-TRANSLATED STOP
CODON"

(ix) FEATURE:

10 (A) NAME/KEY: 3'UTR
(B) LOCATION: 226..228
(D) OTHER INFORMATION: /function= "NON-TRANSLATED STOP
CODON"

15

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

AGC TTG GAT AAA AGA GCA CCA ATG GGT TCA GAC CCT CCA ACC GCA TGC
48
20 Ser Leu Asp Lys Arg Ala Pro Met Gly Ser Asp Pro Pro Thr Ala Cys
1 5 10 15
TGC TTT TCT TAC ACC GCT AGG AAG TTG CCT AGA AAC TTT GTG GTC GAC
96
Cys Phe Ser Tyr Thr Ala Arg Lys Leu Pro Arg Asn Phe Val Val Asp
20 25 30
30 TAC TAT GAG ACC TCT TCT TTG TGC TCC CAG CCA GCT GTG GTA TTC CAA
144
Tyr Tyr Glu Thr Ser Ser Leu Cys Ser Gln Pro Ala Val Val Phe Gln
35 35 40 45
ACC AAA AGA TCC AAG CAA GTC TGT GCT GAC CCG AGT GAA TCC TGG GTC
40 192

Thr Lys Arg Ser Lys Gln Val Cys Ala Asp Pro Ser Glu Ser Trp Val

50

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CAG GAG TAC GTG TAT GAC TTG GAA TTG AAC TGA TAAG

229

Gln Glu Tyr Val Tyr Asp Leu Glu Leu Asn *

65

70

75

10

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

15

(A) LENGTH: 75 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Ser Leu Asp Lys Arg Ala Pro Met Gly Ser Asp Pro Pro Thr Ala Cys

1

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Cys Phe Ser Tyr Thr Ala Arg Lys Leu Pro Arg Asn Phe Val Val Asp

20

25

30

30

Tyr Tyr Glu Thr Ser Ser Leu Cys Ser Gln Pro Ala Val Val Phe Gln

35

40

45

35

Thr Lys Arg Ser Lys Gln Val Cys Ala Asp Pro Ser Glu Ser Trp Val

50

55

60

Gln Glu Tyr Val Tyr Asp Leu Glu Leu Asn *

40

65

70

75

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

5

(A) LENGTH: 229 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

10

(ii) MOLECULE TYPE: DNA (genomic)

(iii) ANTI-SENSE: YES

15

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

CTTATCAGTT CAATTCCAAG TCATACACGT ACTCCTGGAC CCAGGATTCA CTCGGGTCAG
60

20

CACAGACTTG CTTGGATCTT TTGGTTTGGA ATACCACAGC TGGCTGGGAG CACAAAGAAG
120

25

AGGTCTCATA GTAGTCGACC ACAAAGTTTC TAGGCAACTT CCTAGCGGTG TAAGAAAAGC
180

AGCATGCGGT TGGAGGGTCT GAACCCATTG GTGCTCTTTT ATCCAAGCT
229

30

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

35

(A) LENGTH: 46 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..46
- (D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF HUMAN ACT-2 GENE"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

10 AGCTTGGATA AAAGAGCACC AATGGGTTC AACCCTCCAA CCGCAT
46

(2) INFORMATION FOR SEQ ID NO:38:

15 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 45 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..45
- (D) OTHER INFORMATION: /product= "OLIGOMER FOR
CONSTRUCTION OF HUMAN ACT-2 GENE"

25

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

AGCATGCGGT TGGAGGGTCT GAACCCATTG GTGCTCTTTT ATCCA
45

35

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 47 base pairs
- (B) TYPE: nucleic acid

40

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

5

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..47

10

(D) OTHER INFORMATION: /product= "Oligomer for
construction of human ACT-2 gene"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

15

GCTGCTTTTC TTACACCGCT AGGAAGTTGC CTAGAACTT TGTGGTC

47

(2) INFORMATION FOR SEQ ID NO:40:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 51 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

25

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..51

(D) OTHER INFORMATION: /product= "Oligomer for
construction of human ACT-2 gene"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

AGTAGTCGAC CACAAAGTTT CTAGGCAACT TCCTAGCGGT GTAAGAAAAG C

40

51

(2) INFORMATION FOR SEQ ID NO:41:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 46 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..46
- (D) OTHER INFORMATION: /product= "Oligomer for construction of human ACT-2 gene"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

GACTACTATG AGACCTCTTC TTTGTGCTCC CAGCCAGCTG TGGTAT
46

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 46 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..46
- (D) OTHER INFORMATION: /product= "Oligomer for construction of human ACT-2 gene"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

GTTTGAATA CCACAGCTGG CTGGGAGCAC AAAGAAGAGG TTCAT

46

5

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

- 10 (A) LENGTH: 47 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

- 20 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..47
(D) OTHER INFORMATION: /product= "Oligomer for
construction of human ACT-2 gene"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

25

TCCAAACCAA AAGATCCAAG CAAGTCTGTG CTGACCCGAG TGAATCC

47

(2) INFORMATION FOR SEQ ID NO:44:

30

(i) SEQUENCE CHARACTERISTICS:

- 35 (A) LENGTH: 47 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..47
(D) OTHER INFORMATION: /product= "Oligomer for
construction of human ACT-2 gene"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

GGACCCAGGA TTCACTCGGG TCAGCACAGA CTTGCTTGGA TCTTTTG
47

10

(2) INFORMATION FOR SEQ ID NO:45:

(i) SEQUENCE CHARACTERISTICS:

15

(A) LENGTH: 43 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

25

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..43
(D) OTHER INFORMATION: /product= "Oligomer for
construction of human ACT-2 gene"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

TGGGTCCAGG AGTACGTGTA TGA CT TGGA TTGAACTGAT AAG
43

35

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

40

(A) LENGTH: 40 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

5

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..40

10 (D) OTHER INFORMATION: /product= "Oligomer for
construction of human ACT-2 gene"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

15 GATCCTTATC AGTTCAATTC CAAGTCATAC ACGTACTCCT
40

(2) INFORMATION FOR SEQ ID NO:47:

20 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

GTTTTCCCAG TCACGAC
17

35 (2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22 base pairs

(B) TYPE: nucleic acid

40 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

GCACAGACTT CTCTCGAGCG CT

10

22

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

15

(A) LENGTH: 30 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

25

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..30

(D) OTHER INFORMATION: /product= "BB6299 oligomer

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

30

GACTTGTCTC GATTGCTCAG TCAAGAAGAT

30

(2) INFORMATION FOR SEQ ID NO:50:

35

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 5 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..22
(D) OTHER INFORMATION: /product= "BB6300 oligomer"

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

AAACAACAAG AGGTTGGAGT GT
22

15 (2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 25 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

- 30 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..25
(D) OTHER INFORMATION: /product= "BB6381 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

35 GAAGAAGTTT CABAGTAGTC AGCAA
25

(2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:

- 40 (A) LENGTH: 25 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..25
(D) OTHER INFORMATION: /product= "BB6302 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

15

GTGGAATTTG AGAAGAGGTG TAAGA
25

(2) INFORMATION FOR SEQ ID NO:53:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..27
(D) OTHER INFORMATION: /product= "BB6303 oligomer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

GTAATCAGCA GTGTTATTTT GTGGAAT
27

40

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..25
- (D) OTHER INFORMATION: /product= "BB6625 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

TTTCAAAGTA GRCAGCAATG AAATT
25

(2) INFORMATION FOR SEQ ID NO:55:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..24
- (D) OTHER INFORMATION: /product= "BB6301 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

AGGTGTAAGA TTGACAACAA GCGG

24

(2) INFORMATION FOR SEQ ID NO:56:

5

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

10

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..25
- (D) OTHER INFORMATION: /product= "BB6382 oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

AGTAGTCAGC ABTGAAATTT TGTGG

25

25

(2) INFORMATION FOR SEQ ID NO:57:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

30

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..24
- (D) OTHER INFORMATION: /product= "BB6383 oligomer"

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

TAGTCAAGAA TCTGACACCT GGCT

5

24

(2) INFORMATION FOR SEQ ID NO:58:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 26 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

20

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..26

(D) OTHER INFORMATION: /product= "BB6384 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

25

GCACAGACTT GTTCCGAGCG CTTAGT

26

(2) INFORMATION FOR SEQ ID NO:59:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 35 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

35

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..35
- (D) OTHER INFORMATION: /product= "BB6385 oligomer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

AATTCCAAGT TAGAAACATA TTGTTGAACC CATTC
35

10

(2) INFORMATION FOR SEQ ID NO:60:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

20

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..25
- (D) OTHER INFORMATION: /product= "BB6345 oligomer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

GAAGAAGTTT CTTCGTAGTC AGCAA
25

30

(2) INFORMATION FOR SEQ ID NO:61:

35

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 5 (A) NAME/KEY: misc_feature
 (B) LOCATION: 1..27
 (D) OTHER INFORMATION: /product= "BB7015 oligomer"

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

TGAGAAGAAG TTTCTTCGTA GTCAGCA
 27

15 (2) INFORMATION FOR SEQ ID NO:62:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 base pairs
 (B) TYPE: nucleic acid
20 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
 (B) LOCATION: 1..27
 (D) OTHER INFORMATION: /product= "BB9112 oligomer"
30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

TTGAACCCAG CGGCGAGATG GGTCAGC
35 27

(2) INFORMATION FOR SEQ ID NO:63:

(i) SEQUENCE CHARACTERISTICS:

- 40 (A) LENGTH: 24 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..24
(D) OTHER INFORMATION: /product= "BB9109 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

15

TTGAGAAGAA GTTCTAAAGT AGTC
24

(2) INFORMATION FOR SEQ ID NO:64:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 24 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..24
(D) OTHER INFORMATION: /product= "BB9110 oligomer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

ATTTTGTGGA ATTTCTCTAG AGGT
24

40

(2) INFORMATION FOR SEQ ID NO:65:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..30
- (D) OTHER INFORMATION: /product= "BB9111 Oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

ATTTTGTGGA ATTCAGAAG AGGTGTAAGA
30

(2) INFORMATION FOR SEQ ID NO:66:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..30
- (D) OTHER INFORMATION: /product= "BB9104 Oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

AGCAGCCAAG GAAGCAGATC TTTTATCCAA

30

(2) INFORMATION FOR SEQ ID NO:67:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 36 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..36

(D) OTHER INFORMATION: /product= "BB9105 Oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

GTCAGCAGCC AATGGAGCAG ACAATCTTTT ATCCAA

36

25

(2) INFORMATION FOR SEQ ID NO:68:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 24 base pairs

30

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..24

40

(D) OTHER INFORMATION: /product= "BB9106 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

TGGAGTGTCA GCTCTTTTAT CCAA

5

24

(2) INFORMATION FOR SEQ ID NO:69:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 30 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

20

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..30

(D) OTHER INFORMATION: /product= "BB9103 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

25

GTCAGCAGCC AATGGAGCTC TTTTATCCAA

30

(2) INFORMATION FOR SEQ ID NO:70:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 48 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

35

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..48
(D) OTHER INFORMATION: /product= "BB9108 oligomer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

ACAGACTTGT CTACCGCGCT TAGTCAAGAA GATGACAGAT GGCTTGGA
48

10

(2) INFORMATION FOR SEQ ID NO:71:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 24 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

20

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION: 1..24
(D) OTHER INFORMATION: /product= "BB9107 oligomer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

AATTGTCTA GAGAAGTAAG AGAA
24

30

(2) INFORMATION FOR SEQ ID NO:72:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

35

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(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 5 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..21
(D) OTHER INFORMATION: /product= "BB9512 oligomer"

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

CAGCACAGAC AGATCTCGAG C
21

15 (2) INFORMATION FOR SEQ ID NO:73:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

- 30 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..18
(D) OTHER INFORMATION: /product= "BB9432 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

35 CAAAGTAGGA AGCAATGA
18

(2) INFORMATION FOR SEQ ID NO:74:

(i) SEQUENCE CHARACTERISTICS:

- 40 (A) LENGTH: 19 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
(D) OTHER INFORMATION: /product= "BB9519 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

15

GTGTAAGAGG CACAACAAG

19

(2) INFORMATION FOR SEQ ID NO:75:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
(D) OTHER INFORMATION: /product= "BB9527 oligomer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

GAAGTTTCAG CGTAGTCAG

19

40

(2) INFORMATION FOR SEQ ID NO:76:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..21
- (D) OTHER INFORMATION: /product= "BB9431 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

GTAGTCAGCA GCGAAATTTT G

21

(2) INFORMATION FOR SEQ ID NO:77:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..19
- (D) OTHER INFORMATION: /product= "BB9534 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

GTCAAGAAGG CGACACCTG

19

(2) INFORMATION FOR SEQ ID NO:78:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..21

(D) OTHER INFORMATION: /product= "BB9437 oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:78:

CACAGACTTG AGACGAGCGC T

21

25

(2) INFORMATION FOR SEQ ID NO:79:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22 base pairs

30

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..22

40

(D) OTHER INFORMATION: /product= "BB9433 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:79:

GAGAAGAAGT AGAAAAGTAG TC

5

22

(2) INFORMATION FOR SEQ ID NO:80:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 21 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

20

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..21

(D) OTHER INFORMATION: /product= "BB9506 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:80:

25

TTTGTGGAAT AGATCTAGAG G

21

(2) INFORMATION FOR SEQ ID NO:81:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 23 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

35

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..23
(D) OTHER INFORMATION: /product= "BB10194 oligomer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:81:

GGTTGGAGTG CGAGCAGCCA AGG
23

10

(2) INFORMATION FOR SEQ ID NO:82:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

20

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION: 1..22
(D) OTHER INFORMATION: /product= "BB10195 oligomer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:82:

GGAATTGTGTT CAGAGGTGTA AG
22

30

(2) INFORMATION FOR SEQ ID NO:83:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 27 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

35

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 5 (A) NAME/KEY: misc_feature
 (B) LOCATION: 1..27
 (D) OTHER INFORMATION: /product= "BB10196 oligomer"

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:83:

GCACAGACTT GTCTTCGCG CTTAGTC
 27

15 (2) INFORMATION FOR SEQ ID NO:84:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 base pairs
 (B) TYPE: nucleic acid
20 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
 (B) LOCATION: 1..29
 (D) OTHER INFORMATION: /product= "BB10197 oligomer"
30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:84:

GGAGTGTGTCAG CAGCTTCGGA TCTTTTATC
35 29

(2) INFORMATION FOR SEQ ID NO:85:

(i) SEQUENCE CHARACTERISTICS:

- 40 (A) LENGTH: 22 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..22
(D) OTHER INFORMATION: /product= "BB10198 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:85:

15

GGAGTGTCTAG CTTCCAAGGA TC

22

(2) INFORMATION FOR SEQ ID NO:86:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 23 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..23
(D) OTHER INFORMATION: /product= "BB10199 oligomer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:86:

GGTTGGAGTG TCTTCAGCCA AGG

23

40

(2) INFORMATION FOR SEQ ID NO:87:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..22
- (D) OTHER INFORMATION: /product= "BB10200 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:87:

GGAATTCTT CAGAGGTGTA AG
22

(2) INFORMATION FOR SEQ ID NO:88:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 28 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..28
- (D) OTHER INFORMATION: /product= "BB10201 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:88:

CCTTATTAGG CAGATTCTTC CAAGTCAG

28

(2) INFORMATION FOR SEQ ID NO:89:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 20 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..20

(D) OTHER INFORMATION: /product= "BB9537 oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:89:

GACTTGTCTA GCGCGCTTAG

20

25

(2) INFORMATION FOR SEQ ID NO:90:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 base pairs

30

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..19

40

(D) OTHER INFORMATION: /product= "BB9497 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:90:

GTCAGCAGCA GCGGATCTT

5

19

(2) INFORMATION FOR SEQ ID NO:91:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

20

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..17

(D) OTHER INFORMATION: /product= "BB9498 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:91:

25

GTCAGCAGAC AAGGATC

17

(2) INFORMATION FOR SEQ ID NO:92:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 18 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

35

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..18
- (D) OTHER INFORMATION: /product= "BB9499 oligomer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:92:

GAGTGTGAGA AGCCAAGG

18

10

(2) INFORMATION FOR SEQ ID NO:93:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

20

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..22
- (D) OTHER INFORMATION: /product= "BB9517 oligomer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:93:

ATTAGGCAGA GGCTTCCAAG TC

22

30

(2) INFORMATION FOR SEQ ID NO:94:

35

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 34 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

5

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..34

(D) OTHER INFORMATION: /product= "BB9781 oligomer"

10

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:94:

GAGAAACAAC AAGCGGTAGA TCTTTTATCC AAGC

34

15

(2) INFORMATION FOR SEQ ID NO:95:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 20 base pairs

(B) TYPE: nucleic acid

20

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..20

(D) OTHER INFORMATION: /product= "BB9430 oligomer"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:95:

GTTGGAGTGG AAGCAGCCAA

35

20

(2) INFORMATION FOR SEQ ID NO:96:

(i) SEQUENCE CHARACTERISTICS:

40

(A) LENGTH: 18 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..18
(D) OTHER INFORMATION: /product= "BB9525 oligomer"

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:96:

CAGCAATGGC ATTTTGTG
18

20 (2) INFORMATION FOR SEQ ID NO:97:

(i) SEQUENCE CHARACTERISTICS:

25 (A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30 (ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..21
(D) OTHER INFORMATION: /product= "BB9435 oligomer"

35 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:97:

GTCTCGAGCG AGAAGTCAAG A
21

40

(2) INFORMATION FOR SEQ ID NO:98:

(i) SEQUENCE CHARACTERISTICS:

- 5 (A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

10

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
(B) LOCATION: 1..18
15 (D) OTHER INFORMATION: /product= "BB9436 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:98:

20 GTCTCGAGGA CTTAGTCA

18

(2) INFORMATION FOR SEQ ID NO:99:

25 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

30

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 35 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..22
(D) OTHER INFORMATION: /product= "BB9423 oligomer"

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:99:

GAACCCATTC AGAAGATGGG TC

22

(2) INFORMATION FOR SEQ ID NO:100:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..21

(D) OTHER INFORMATION: /product= "BB9424 oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:100:

TTTGAACCCA AGATTCAGAT G

21

25

(2) INFORMATION FOR SEQ ID NO:101:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 base pairs

30

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..21

40

(D) OTHER INFORMATION: /product= "BB9425 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:101:

CAGAAACATA AGATTGAACC C

5

21

(2) INFORMATION FOR SEQ ID NO:102:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 20 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

20

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..20

(D) OTHER INFORMATION: /product= "BB9427 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:102:

25

CAATTCCAAG GAAGAAACAT

20

(2) INFORMATION FOR SEQ ID NO:103:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

35

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..17
- (D) OTHER INFORMATION: /product= "BB9503 oligomer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:103:

CCTTATTAGT CAGAAAC

17

10

(2) INFORMATION FOR SEQ ID NO:104:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 33 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

20

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..33
- (D) OTHER INFORMATION: /product= "BB9443 oligomer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:104:

TTGAGAAGAA GTTCTAAAGT AGGCAGCAAT GAA

33

30

(2) INFORMATION FOR SEQ ID NO:105:

35

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 5 (A) NAME/KEY: misc_feature
 (B) LOCATION: 1..20
 (D) OTHER INFORMATION: /product= "BB9434 oligomer"

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:105:

GACACCTGGA GAGGAACATT

20

15 (2) INFORMATION FOR SEQ ID NO:106:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
 (B) TYPE: nucleic acid
20 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
 (B) LOCATION: 1..22
 (D) OTHER INFORMATION: /product= "BB9228 oligomer"
30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:106:

CAGACAATTC AGCGTCAGAA AC

35

22

(2) INFORMATION FOR SEQ ID NO:107:

(i) SEQUENCE CHARACTERISTICS:

- 40 (A) LENGTH: 20 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..20
(D) OTHER INFORMATION: /product= "BB9429 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:107:

15

GGCAGACAAA GACAAGTCAG

20

(2) INFORMATION FOR SEQ ID NO:108:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
(D) OTHER INFORMATION: /product= "BB9495 oligomer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:108:

CTTATTAGGA AGACAATTC

19

40

(2) INFORMATION FOR SEQ ID NO:109:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..19
- (D) OTHER INFORMATION: /product= "BB9496 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:109:

20 CAGCCAAGGC TCTTTTATC
19

(2) INFORMATION FOR SEQ ID NO:110:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..20
- (D) OTHER INFORMATION: /product= "BB9509 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:110:

CTTGGAACAA GAAGAAGAAG

20

(2) INFORMATION FOR SEQ ID NO:111:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..19

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:111:

GTCAGAAACA GCTTTTGA

19

25

(2) INFORMATION FOR SEQ ID NO:112:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 base pairs

(B) TYPE: nucleic acid

30

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..19

40

(D) OTHER INFORMATION: /product= "BB9529 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:112:

CATTGAGAAG CAGTTTCAA

19

5

(2) INFORMATION FOR SEQ ID NO:113:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 19 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..19

20

(D) OTHER INFORMATION: /product= "BB9530 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:113:

25

GAACATTGAG CAGAAGTTT

19

(2) INFORMATION FOR SEQ ID NO:114:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

35

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

40

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..21

(D) OTHER INFORMATION: /product= "BB9536 oligomer"

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:114:

GCGCTTAGTA GCGAAGATGA C

21

10 (2) INFORMATION FOR SEQ ID NO:115:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22 base pairs

(B) TYPE: nucleic acid

15 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

20

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..22

(D) OTHER INFORMATION: /product= "BB9422 oligomer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:115:

CTTCAGATGG AGAAGCACAG AC

30

22

(2) INFORMATION FOR SEQ ID NO:116:

(i) SEQUENCE CHARACTERISTICS:

35 (A) LENGTH: 21 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..21

5 (D) OTHER INFORMATION: /product= "BB9426 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:116:

10 CAAGTCAGAA GCATATTTTT G

21

(2) INFORMATION FOR SEQ ID NO:117:

15 (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

25 (A) NAME/KEY: misc_feature

(B) LOCATION: 1..17

(D) OTHER INFORMATION: /product= "BB9504 oligomer"

30 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:117:

GGTGTAAAGCG AAACAAC

17

35 (2) INFORMATION FOR SEQ ID NO:118:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 base pairs

(B) TYPE: nucleic acid

40 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

5

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..19

(D) OTHER INFORMATION: /product= "BB9505 oligomer"

10

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:118:

ATTGTCTAG CGGTGTAAG

15

19

(2) INFORMATION FOR SEQ ID NO:119:

(i) SEQUENCE CHARACTERISTICS:

20

(A) LENGTH: 20 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

25

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

(A) NAME/KEY: misc_feature

30

(B) LOCATION: 1..20

(D) OTHER INFORMATION: /product= "BB9507 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:119:

35

GAAATTTTGA GCAATTTGTC

20

(2) INFORMATION FOR SEQ ID NO:120:

40

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 18 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
5 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

10 (ix) FEATURE:
 (A) NAME/KEY: misc_feature
 (B) LOCATION: 1..18
 (D) OTHER INFORMATION: /product= "BB9510 oligomer"

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:120:

CTGGCTTGGC ACATTGAG
 18

20 (2) INFORMATION FOR SEQ ID NO:121:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 23 base pairs
25 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30 (ix) FEATURE:
 (A) NAME/KEY: misc_feature
 (B) LOCATION: 1..23
35 (D) OTHER INFORMATION: /product= "BB9514 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:121:

40 GAAACATATT TAGAAACCCA TTC

23

(2) INFORMATION FOR SEQ ID NO:122:

- 5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

10

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 15 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..19

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:122:

20

ATTAGGCAGC CAATTCCAA

19

(2) INFORMATION FOR SEQ ID NO:123:

25

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

30

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

35

- (A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
(D) OTHER INFORMATION: /product= "BB9520 oligomer"

40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:123:

CTAGAGGTGG CAGAGAAAC

19

5

(2) INFORMATION FOR SEQ ID NO:124:

(i) SEQUENCE CHARACTERISTICS:

- 10 (A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

- 20 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
(D) OTHER INFORMATION: /product= "BB9522 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:124:

25 TTTTGTGGAG CTTGTCTAG

19

(2) INFORMATION FOR SEQ ID NO:125:

30 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

35

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 40 (A) NAME/KEY: misc_feature

(B) LOCATION: 1..20

(D) OTHER INFORMATION: /product= "BB9531 oligomer"

5 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:125:

GATGACACCA GCCTTGAAC

20

10 (2) INFORMATION FOR SEQ ID NO:126:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 20 base pairs

(B) TYPE: nucleic acid

15 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

20

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..20

(D) OTHER INFORMATION: /product= "BB9532 oligomer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:126:

GAAGATGACA GCTGGCTTGG

30 20

(2) INFORMATION FOR SEQ ID NO:127:

(i) SEQUENCE CHARACTERISTICS:

35 (A) LENGTH: 18 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..18
- (D) OTHER INFORMATION: /product= "BB9533 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:127:

10 AGAAGATGGC ACCTGGCT
18

(2) INFORMATION FOR SEQ ID NO:128:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 17 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..17
- (D) OTHER INFORMATION: /product= "BB9500 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:128:

GGTTGGAGCG TCAGCAG
17

(2) INFORMATION FOR SEQ ID NO:129:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 22 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

5

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..22

(D) OTHER INFORMATION: /product= "BB9523 oligomer"

10

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:129:

CAATGAAATT AGATGGAATT TG

15

22

(2) INFORMATION FOR SEQ ID NO:130:

(i) SEQUENCE CHARACTERISTICS:

20

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

25

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

(A) NAME/KEY: misc_feature

30

(B) LOCATION: 1..17

(D) OTHER INFORMATION: /product= "BB9511 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:130:

35

GCGCTTAGCC AAGAAGA

17

(2) INFORMATION FOR SEQ ID NO:131:

40

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

10 (ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
(D) OTHER INFORMATION: /product= "BB9501 oligomer"

15 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:131:

CAAGCGGTAG CAGTGTCAG
19

20 (2) INFORMATION FOR SEQ ID NO:132:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

25 (ii) MOLECULE TYPE: DNA

30 (ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION: 1..18
(D) OTHER INFORMATION: /product= "BB9502 oligomer"

35 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:132:

40 ACAAGCGGCT GGAGTGTC

18

(2) INFORMATION FOR SEQ ID NO:133:

- 5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

10

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 15 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..18
(D) OTHER INFORMATION: /product= "BB9508 oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:133:

GTTTCAAAGG CGTCAGCA

18

25

(2) INFORMATION FOR SEQ ID NO:134:

- (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20 base pairs
(B) TYPE: nucleic acid
30 (C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
(B) LOCATION: 1..20
(D) OTHER INFORMATION: /product= "BB9513 oligomer"
40

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:134:

TTCTTCAGAT GCGTCAGCAC

5 20

(2) INFORMATION FOR SEQ ID NO:135:

(i) SEQUENCE CHARACTERISTICS:

- 10 (A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

15 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 20 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..18
(D) OTHER INFORMATION: /product= "BB9516 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:135:

25 CAAGTCAGCA ACATATTT
18

(2) INFORMATION FOR SEQ ID NO:136:

- 30 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 17 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
35 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40 (ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..17
(D) OTHER INFORMATION: /product= "BB9521 oligomer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:136:

GTCTAGAGGC GTAAGAG

17

10

(2) INFORMATION FOR SEQ ID NO:137:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

20

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..17
(D) OTHER INFORMATION: /product= "BB9524 oligomer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:137:

CAATGAAAGA TTGTGGAA

18

30

(2) INFORMATION FOR SEQ ID NO:138:

35

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 5 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..17
(D) OTHER INFORMATION: /product= "BB9526 oligomer"

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:138:

GTAGTCAGAA ATGAAAT

17

15

(2) INFORMATION FOR SEQ ID NO:139:

(i) SEQUENCE CHARACTERISTICS:

- 20 (A) LENGTH: 18 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
(B) LOCATION: 1..18
30 (D) OTHER INFORMATION: /product= "BB9528 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:139:

35 GAGAAGAAGC TTCAAAGT

18

(2) INFORMATION FOR SEQ ID NO:140:

40 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

5

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..20
- (D) OTHER INFORMATION: /product= "BB9535 oligomer"

15

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:140:

CTTAGTCAAG GCGATGACAC

20

20

(2) INFORMATION FOR SEQ ID NO:141:

(i) SEQUENCE CHARACTERISTICS:

25

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..20
- (D) OTHER INFORMATION: /product= "BB9538 oligomer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:141:

GTCAGCACAG GCTTGCTCTCG

40

20

(2) INFORMATION FOR SEQ ID NO:142:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..17
- (D) OTHER INFORMATION: /product= "BB9539 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:142:

TGGGTCAGAA CAGACTT

17

(2) INFORMATION FOR SEQ ID NO:143:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..19
- (D) OTHER INFORMATION: /product= "BB9540 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:143:

CATTCTTCAG CTGGGTCAG

19

(2) INFORMATION FOR SEQ ID NO:144:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 20 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..20

(D) OTHER INFORMATION: /product= "BB9541 oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:144:

ATTTTGAAC AGCTTCTTCA

20

25

(2) INFORMATION FOR SEQ ID NO:145:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22 base pairs

30

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..22

40

(D) OTHER INFORMATION: /product= "BB9542 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:145:

CATATTTTGTG AGCCCATCTC TC

5 22

(2) INFORMATION FOR SEQ ID NO:146:

(i) SEQUENCE CHARACTERISTICS:

- 10 (A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

15 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- 20 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..21
(D) OTHER INFORMATION: /product= "BB10374 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:146:

25 TTTTGAACC AATTCTTCAG A
21

(2) INFORMATION FOR SEQ ID NO:147:

30

(i) SEQUENCE CHARACTERISTICS:

- 35 (A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40 (ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..21
(D) OTHER INFORMATION: /product= "BB10375 oligomer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:147:

CAGAAACATA ATCTTGAACC C

21

10

(2) INFORMATION FOR SEQ ID NO:148:

(i) SEQUENCE CHARACTERISTICS:

15

(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

20

(ix) FEATURE:

25

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
(D) OTHER INFORMATION: /product= "BB10376 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:148:

30

GTCAGAAACA TCTTTTGA

19

(2) INFORMATION FOR SEQ ID NO:149:

35

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

5

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..19

(D) OTHER INFORMATION: /product= "BB10377 oligomer"

10

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:149:

GTGTAAGAAT CACAACAAG

19

15

(2) INFORMATION FOR SEQ ID NO:150:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 23 base pairs

(B) TYPE: nucleic acid

20

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..23

(D) OTHER INFORMATION: /product= "BB11235 oligomer"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:150:

GAAACAACAA GCTTCTGGAG TGT

35

23

(2) INFORMATION FOR SEQ ID NO:151:

(i) SEQUENCE CHARACTERISTICS:

40

(A) LENGTH: 19 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
(D) OTHER INFORMATION: /product= "BB10379 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:151:

15

ATTAGGCTTC CAATTCAA

19

(2) INFORMATION FOR SEQ ID NO:152:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..22
(D) OTHER INFORMATION: /product= "BB10380 oligomer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:152:

ATTAGGCAGA ATCTTCCAAG TC

22

40

(2) INFORMATION FOR SEQ ID NO:153:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..20
- (D) OTHER INFORMATION: /product= "BB10381 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:153:

CAATTCCAAT CTAGAAACAT

20

(2) INFORMATION FOR SEQ ID NO:154:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..19
- (D) OTHER INFORMATION: /product= "BB10382 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:154:

CATTGAGATT CAGTTTCAA

19

(2) INFORMATION FOR SEQ ID NO:155:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..19

(D) OTHER INFORMATION: /product= "BB10383 oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:155:

GTCAAGAAGT TGACACCTG

19

25

(2) INFORMATION FOR SEQ ID NO:156:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 base pairs

30

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..21

40

(D) OTHER INFORMATION: /product= "BB10964 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:156:

GCGCTTAGTG TTGAAGATGA C

5

21

(2) INFORMATION FOR SEQ ID NO:157:

(i) SEQUENCE CHARACTERISTICS:

10

(A) LENGTH: 27 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

20

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..27

(D) OTHER INFORMATION: /product= "BB10385 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:157:

25

GTAAGAGAAA CATTGACAAG CGGTTGG

27

(2) INFORMATION FOR SEQ ID NO:158:

30

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 24 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

35

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

40

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..24
- (D) OTHER INFORMATION: /product= "BB10386 oligomer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:158:

TTGAACCCAT TGTGAGATG GGTC

24

10

(2) INFORMATION FOR SEQ ID NO:159:

(i) SEQUENCE CHARACTERISTICS:

15

- (A) LENGTH: 21 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

25

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..21
- (D) OTHER INFORMATION: /product= "BB10529 oligomer"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:159:

GTTTCAAAGT ATTGAGCAAT G

21

(2) INFORMATION FOR SEQ ID NO:160:

35

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 26 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

40

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

5

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..26

(D) OTHER INFORMATION: /product= "BB10530 oligomer"

10

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:160:

GATGACACCT GGTTCGGAAC ATTGAG

26

15

(2) INFORMATION FOR SEQ ID NO:161:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 26 base pairs

(B) TYPE: nucleic acid

20

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

25

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..26

(D) OTHER INFORMATION: /product= "BB10531 oligomer"

30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:161:

CTTGTCTCGA GCGTTCAGTC AAGAAG

35

26

(2) INFORMATION FOR SEQ ID NO:162:

(i) SEQUENCE CHARACTERISTICS:

40

(A) LENGTH: 25 base pairs

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..25
(D) OTHER INFORMATION: /product= "BB10532 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:162:

15 GACTTGTCTC GATTCTTAG TCAAG
25

(2) INFORMATION FOR SEQ ID NO:163:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 27 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

30 (ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..27
(D) OTHER INFORMATION: /product= "BB10533 oligomer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:163:

CCATTCTTCA GATGGTGGAG CACAGAC
27

40

(2) INFORMATION FOR SEQ ID NO:164:

5 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 19 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

10 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION: 1..19
15 (D) OTHER INFORMATION: /product= "BB10534 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:164:

20 GCAGACAATT GCAAGTCAG
19

(2) INFORMATION FOR SEQ ID NO:165:

25 (i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 21 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

30 (ii) MOLECULE TYPE: DNA

(ix) FEATURE:
35 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..21
(D) OTHER INFORMATION: /product= "BB10535 oligomer"

40 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:165:

GTAGTCAGCC AAGAAATTTT G

21

(2) INFORMATION FOR SEQ ID NO:166:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 21 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..21

(D) OTHER INFORMATION: /product= "BB10536 oligomer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:166:

GTAGTCAGCG ACGAAATTTT G

21

25

(2) INFORMATION FOR SEQ ID NO:167:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22 base pairs

30

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..22

40

(D) OTHER INFORMATION: /product= "BB10195 oligomer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:167:

GGAATTTGTT CAGAGGTGTA AG

5

22

(2) INFORMATION FOR SEQ ID NO:168:

10

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

15

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

20

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..17

(D) OTHER INFORMATION: /product= "BB5769 primer"

25

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:168:

GCATTCTGAC ATCCTCT

17

30

(2) INFORMATION FOR SEQ ID NO:169:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 31 base pairs

(B) TYPE: nucleic acid

35

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

40

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..31
- (D) OTHER INFORMATION: /product= "BB6040 primer"

5

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:169:

CGTTAAATC AACAACTTGT CAATTGGAAC C

10

31

(2) INFORMATION FOR SEQ ID NO:170:

(i) SEQUENCE CHARACTERISTICS:

15

- (A) LENGTH: 17 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

20

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

25

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..17
- (D) OTHER INFORMATION: /product= "BB6296 primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:170:

30

GGAAATCTCA CAGATCT

17

(2) INFORMATION FOR SEQ ID NO:171:

35

(i) SEQUENCE CHARACTERISTICS:

40

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- 5 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..24
(D) OTHER INFORMATION: /product= "BB8461 primer"

10 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:171:

GAAGGAAATC TCATCGTTTG AATA

24

15 (2) INFORMATION FOR SEQ ID NO:172:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 base pairs
(B) TYPE: nucleic acid
20 (C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

25

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
(B) LOCATION: 1..17
(D) OTHER INFORMATION: /product= "BB8740 primer"
30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:172:

GCTAATGCGG AGGATGC

35 17

(2) INFORMATION FOR SEQ ID NO:173:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 base pairs
40

(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

5 (ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

10 (A) NAME/KEY: misc_feature
(B) LOCATION: 1..31
(D) OTHER INFORMATION: /product= "BB6394 primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:173:

15

CCGGCATTAC AACTTATCGA TAAGCTTGCA C
31

(2) INFORMATION FOR SEQ ID NO:174:

20

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: single
25 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

30

(ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION: 1..17
(D) OTHER INFORMATION: /product= "BB6037 primer"

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:174:

GCGCATTGTT AGATTTC
17

40

(2) INFORMATION FOR SEQ ID NO:175:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..24
- (D) OTHER INFORMATION: /product= "BB6841 primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:175:

CTTATCGATC AACTTGCACA AACG
24

(2) INFORMATION FOR SEQ ID NO:176:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 28 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: misc_feature
- (B) LOCATION: 1..28
- (D) OTHER INFORMATION: /product= "BB6189 primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:176:

GTCATGTCTA AGGCGGATCC TTATTAAAC

28

(2) INFORMATION FOR SEQ ID NO:177:

5

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 24 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

10

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

15

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..24

(D) OTHER INFORMATION: /product= "BB8661 primer"

20

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:177:

GAGAATGGCA ACAACTTATG CATT

24

25

(2) INFORMATION FOR SEQ ID NO:178:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 17 base pairs

30

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

35

(ix) FEATURE:

(A) NAME/KEY: misc_feature

(B) LOCATION: 1..17

40

(D) OTHER INFORMATION: /product= "BB6038 primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:178:

CCAACATCAA TACAACC

5

17

CLAIMS

1. A proteinaceous molecule with stem cell inhibition (SCI) activity, the molecule being substantially incapable at physiological ionic strength of forming a stable multimer higher than a dodecamer.
5
2. A molecule as claimed in claim 1, which is substantially incapable at physiological ionic strength of forming a stable multimer higher than a tetramer.
10
3. A molecule as claimed in claim 2, which at physiological ionic strength forms a substantially homogeneous population of tetramers.
4. A molecule as claimed in claim 1, which is substantially incapable at physiological ionic strength of forming a stable multimer higher than a dimer.
15
5. A molecule as claimed in claim 1, which is substantially incapable at physiological ionic strength of forming a stable multimer higher than a monomer.
20
6. A molecule as claimed in any one of claims 1 to 5, which is an analogue of a natural SCI in which, relative to the natural SCI, one or more of the amino acid residues involved in promoting and/or stabilising association of the components of a dimeric tetrameric, dodecameric or higher order complex is altered to have a lesser promoting and/or stabilising effect.
25
7. A molecule as claimed in claim 6, wherein the natural SCI is LD78 or MIP-1 α .

8. A molecule as claimed in claim 6, wherein the alteration is a substitution.
9. A molecule as claimed in claim 8, wherein the substitution is such as to cause charge repulsion.
- 5 10. A molecule as claimed in claim 8, wherein a hydrophilic residue is substituted for a hydrophobic residue.
- 10 11. A molecule as claimed in claim 8, wherein a neutral residue is substituted for a charged residue.
12. A molecule as claimed in claim 6, wherein a small, weakly hydrophobic residue is substituted for a large, strongly hydrophobic residue.
- 15 13. A molecule as claimed in any one of claims 8 to 12, wherein the substitution takes place at one or more of residues 12 to 16 of LD78.
14. A molecule as claimed in claim 12, wherein the substitution is Ile19 > Ala and/or Val39 > Ala.
- 20 15. A molecule as claimed in any one of claims 8 to 11, wherein the substitution takes place at one or more of those residues projecting away from the surface of the dimer in strand 1 of the β sheet, and/or in the turn between strands 2 and 3 of the sheet.
- 25 16. A molecule as claimed in claim 15, wherein the substitution takes place between residues 24 to 29 (inclusive) of LD78 and/or 43 to 47 (inclusive) of LD78.

17. A molecule as claimed in claim 16, wherein the substitution is:
 - (i) Ile24 > Asn;
 - (ii) Tyr27 > Asn;
 - (iii) Phe28 > Glu;
 - (iv) Glu29 > Arg;
 - (v) Lys44 > Glu (especially with Arg45 > Gln); and/or
 - (vi) Arg45 > Glu.

18. A molecule as claimed in any one of claims 8 to 12, wherein the substitution takes place in at least one of those residues which form a chain N-terminal to the turn into strand 1 of the sheet.

19. A molecule as claimed in any one of claims 1 to 8, which is an LD78 analogue having at least one of the following substitutions with respect to wild-type LD78: Lys44 > Glu (with Arg45 > Gln), Arg47 > Glu, Phe28 > Glu, Phe28 > Glu (with Gln48 > Glu), Phe28 > Glu (with Arg47 > Glu), Arg17 > Ser (with Gln18 > Glu), Phe12 > Ala, Val39 > Ala, Ile40 > Ala, Asp26 > Ala (with Glu29 > Arg and Arg47 > Glu), Arg17 > Ser, Glu29 > Arg, Gln18 > Glu, Asp26 > Ser, Gln48 > Ser, Thr15 > Ala, Gln21 > Ser, Phe23 > Ala, Ser32 > Ala, Ala51 > Ser, Ala4 > Glu, Phe12 > Asp, Asp26 > Gln, Lys36 > Glu, Lys44 > Glu, Arg45 > Glu, Glu66 > Gln, Phe12 > Gln, Lys44 > Ser, Arg17 > Glu (with Gln18 > Glu), Asp26 > Ala, Glu66 > Ser.

20. A molecule as claimed in any one of claims 1 to 8, which is an LD78 analogue having at least one of the following substitutions with respect to wild-type LD78: Arg17 > Ser, Glu29 > Arg, Gln18 > Glu, Asp26 > Ser, Gln48 > Ser, Thr15 > Ala, Gln21 > Ser, Phe23 > Ala, Ser32 > Ala, Ala51 > Ser, Ala4 > Glu, Phe12 > Asp, Asp26 > Gln, Lys36 > Glu,

Lys44 > Glu, Arg45 > Glu, Glu66 > Gln, Phe12 > Gln, Lys44 > Ser, Arg17 > Glu (with Gln18 > Glu), Asp26 > Ala, Glu66 > Ser.

- 5 21. A molecule as claimed in any one of claims 1 to 8, which is an LD78 analogue having at least one of the following substitutions with respect to wild-type LD78: Phe12 > Gln, Lys44 > Ser, Arg17 > Glu (with Gln18 > Glu), Asp26 > Ala, Glu66 > Ser.
- 10 22. A molecule as claimed in any one of claims 1 to 8, which is an LD78 analogue having at least one of the following substitutions with respect to wild-type LD78: Asp26 > Ala, Glu66 > Ser.
23. LD78 (Asp26 > Ala).
- 15 24. LD78 (Glu66 > Ser).
- 20 25. A molecule as claimed in any one of claims 1 to 12 which comprises a sequence substantially corresponding to LD78, but with a mutation at one or more (but preferably no more than two) of the following amino acid residues: Ser1, Leu2, Ala3, Ala4, Asp5, Thr6, Ala9, Phe12, Ser13, Tyr14, Ser16, Arg17, Gln18, Ile19, Pro20, Gln21, Phe23, Ile24, Asp26, Tyr27, Phe28, Glu29, Ser31, Ser32, Gln33, Ser35, Lys36, Pro37, Gly38, Val39, Ile40, Leu42, Thr43, Lys44, Arg45, Ser46, Arg47, Gln48, Asp52, Glu55, Glu56, Gln59, Lys60, Tyr61, Val62, Asp64, Leu65, Leu67, Glu66, Ser68 and Ala69.

25
26. A molecule as claimed in any one of claims 1 to 25, which is an LD78 analogue and which is free of any N-terminal extension preceding Ser-1.

27. A molecule as claimed in any one of claims 1 to 26, which is an LD78 analogue and which has an N-terminal deletion, relative to the wild type molecule, of from one to seven residues.
- 5 28. A molecule as claimed in any one of claims 1 to 12, which comprises a sequence substantially corresponding to MIP-1 α , but with a mutation at one or more (but preferably not more than two) of the following amino acid residues: Ala1, Pro2, Tyr3, Gly4, Ala5, Asp6, Thr7, Ala10, Phe13, Ser14, Tyr15, Ser16, Arg17, Lys18, Ile19, Pro20, Arg21, Phe23, Ile24, Asp26, 10 Phe28, Glu29, Ser31, Ser32, Glu33, Ser35, Gln36, Pro37, Gly38, Val39, Ile40, Leu42, Thr43, Lys44, Arg45, Asn46, Arg47, Gln48, Asp52, Glu55, Thr56, Gln59, Glu60, Tyr61, Ile62, Asp64, Leu65, Glu66, Leu67, Asn68 and Ala69.
- 15 29. Nucleic acid coding for a protein as claimed in any one of claims 1 to 28.
30. Nucleic acid as claimed in claim 29, which is recombinant DNA in the form of a vector.
- 20 31. A host cell transfected or transformed with a vector as claimed in claim 30.
32. A compound as claimed in any one of claims 1 to 28 for use in medicine.
- 25 33. The use of a compound as claimed in any one of claims 1 to 28 in the preparation of an agent for use as a stem cell protective agent.
34. A pharmaceutical formulation comprising a compound as claimed in any one of claims 1 to 28 and a pharmaceutically acceptable carrier.

35. A process for producing a compound as claimed in any one of claims 1 to 28 by expression of nucleic acid as claimed in claim 29 in *S. cerevisiae*.
- 5 36. A process for producing a compound as claimed in any one of claims 1 to 28 by expression of nucleic acid as claimed in claim 29 in *P. pastoris*.
- 10 37. A process for the production of a molecule having stem cell inhibitor activity, the process comprising culturing a yeast of the genus *Pichia*, and preferably of the species *pastoris*, the yeast having expressible heterologous nucleic acid coding for the molecule.
- 15 38. A method of increasing protein expression levels in a system in which the desired protein normally forms soluble multimeric complexes at physiological ionic strength (the "multimeric protein"), which method comprises using in the expression system cells which are transformed or transfected with a vector comprising DNA coding, not for the multimeric protein, but instead for a mutant thereof which has a reduced tendency to form soluble multimeric complexes relative to the multimeric protein.
- 20 39. A method as claimed in claim 38, in which the protein has stem cell inhibitor activity.

FIG. 1A

LD78	-SLAADTPTA	CCFSYTSRQI	PQNF IADYFE	TSSQCSKPGV	IFLTKR SRQV	49
ACT-2	APMGSDPPTA	CCFSYTARKL	ERNFVVDYFE	TSSLC SQPAV	VFQTKRSKQV	50
MIP-1 Alpha	APYGADTPTA	CCFSYSRK-I	PRQFIVDYFE	TSSLC SQPGV	IFLTKRNRQI	49
LD78	CADPSEENWQ	KYVSDLELSA				69
ACT-2	CADPSESWQ	EYVYDLELN-				69
MIP-1 Alpha	CADSKETWQ	EYITDLELNA				69

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FIG. 1B

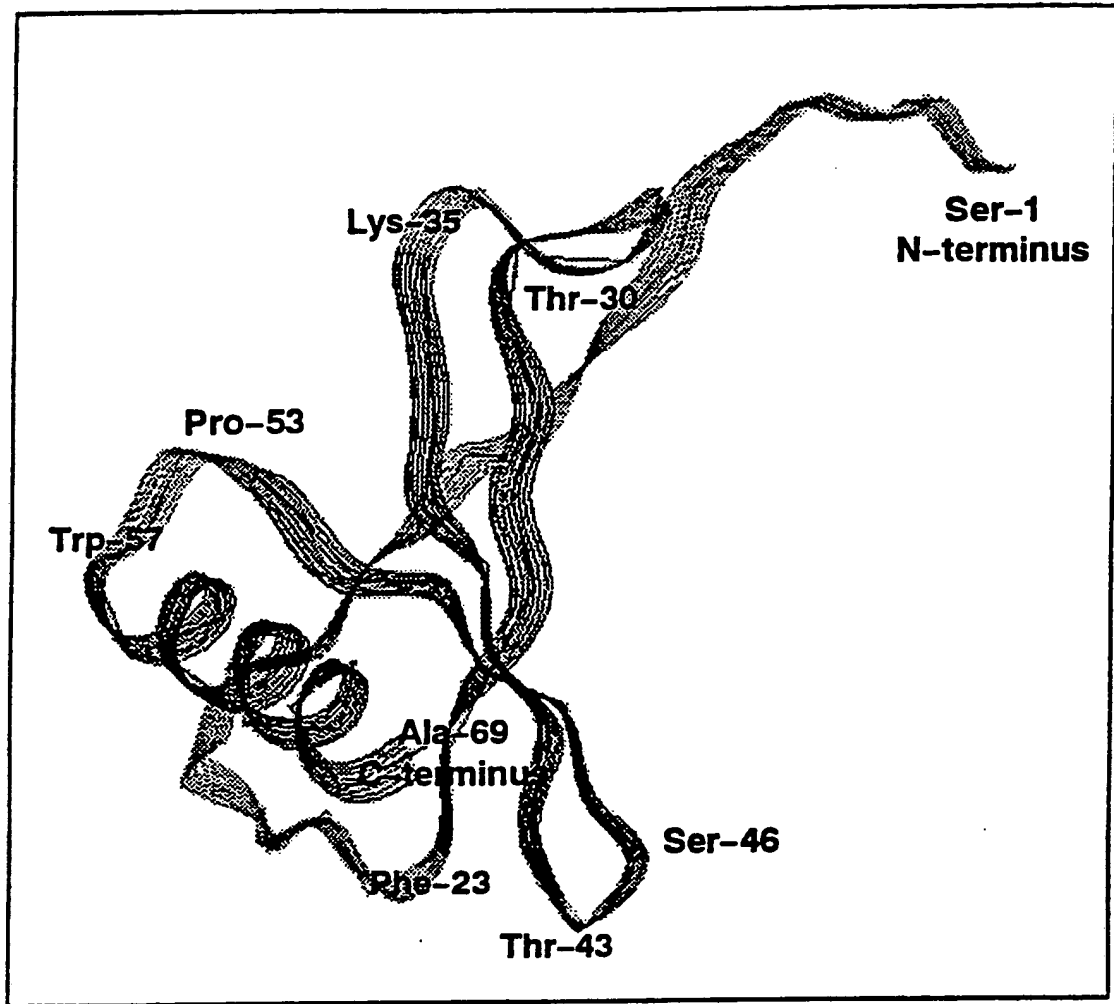


FIG. 1C

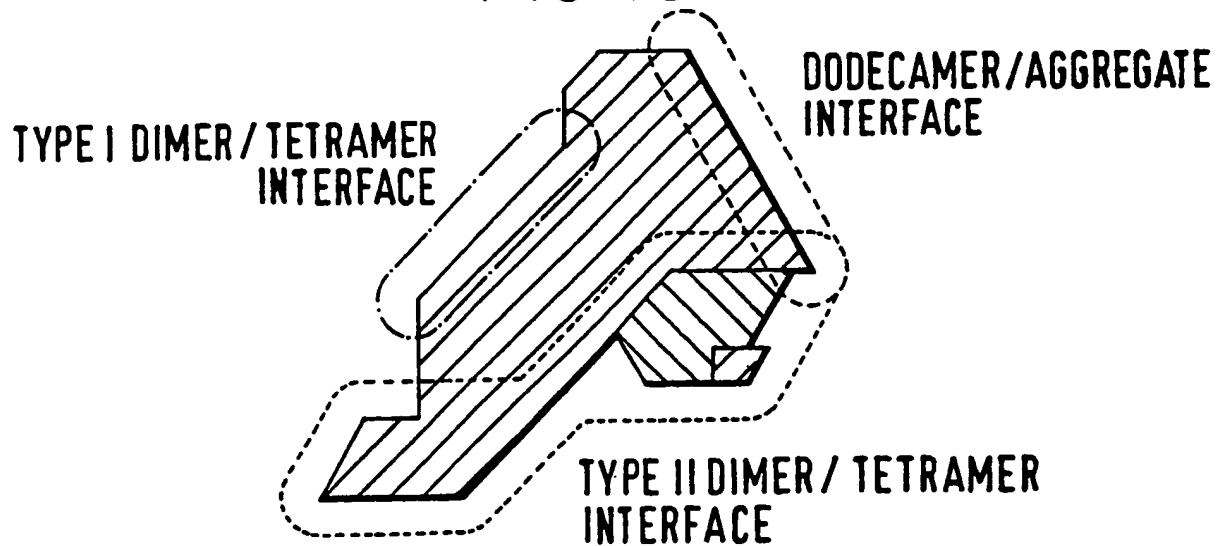


FIG. 1D

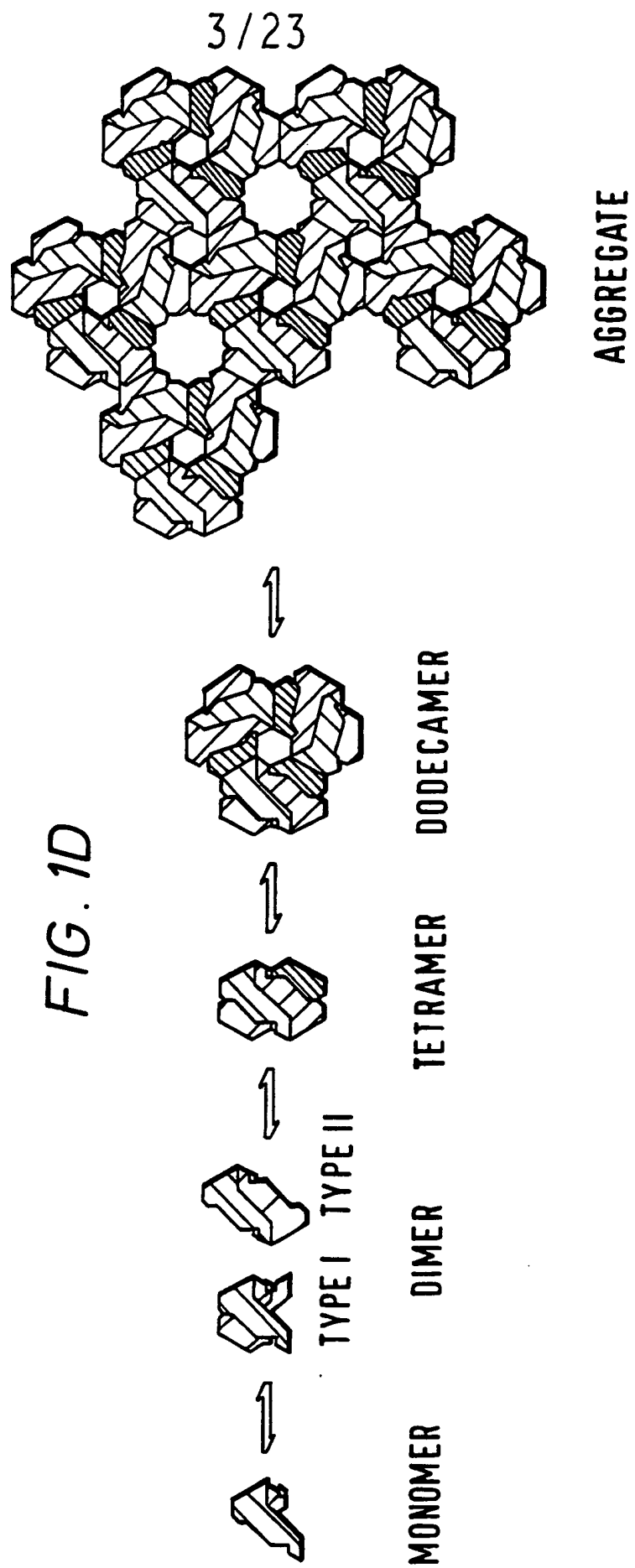
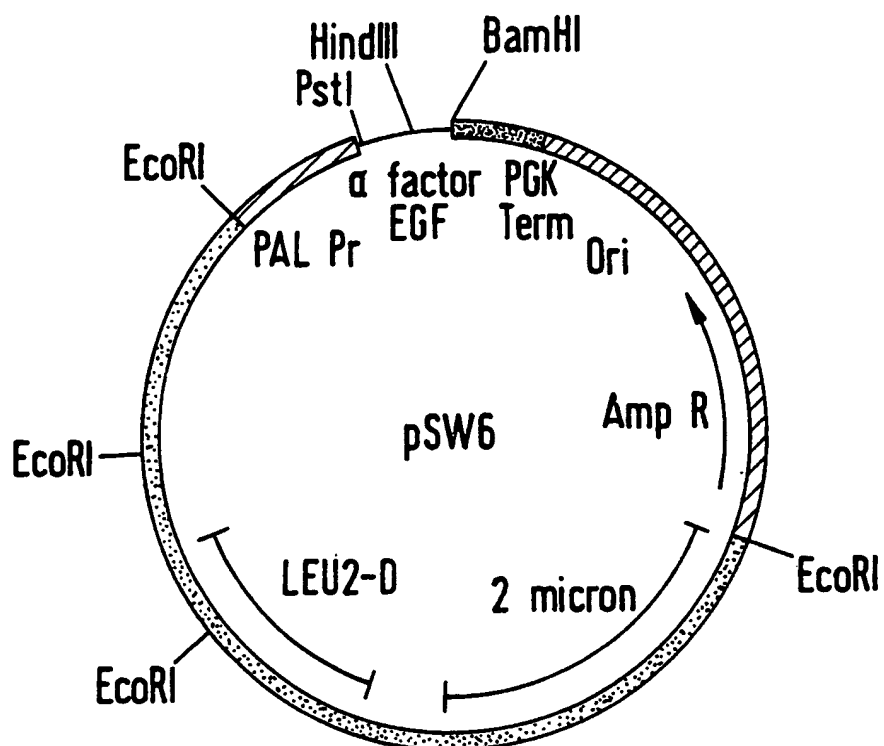
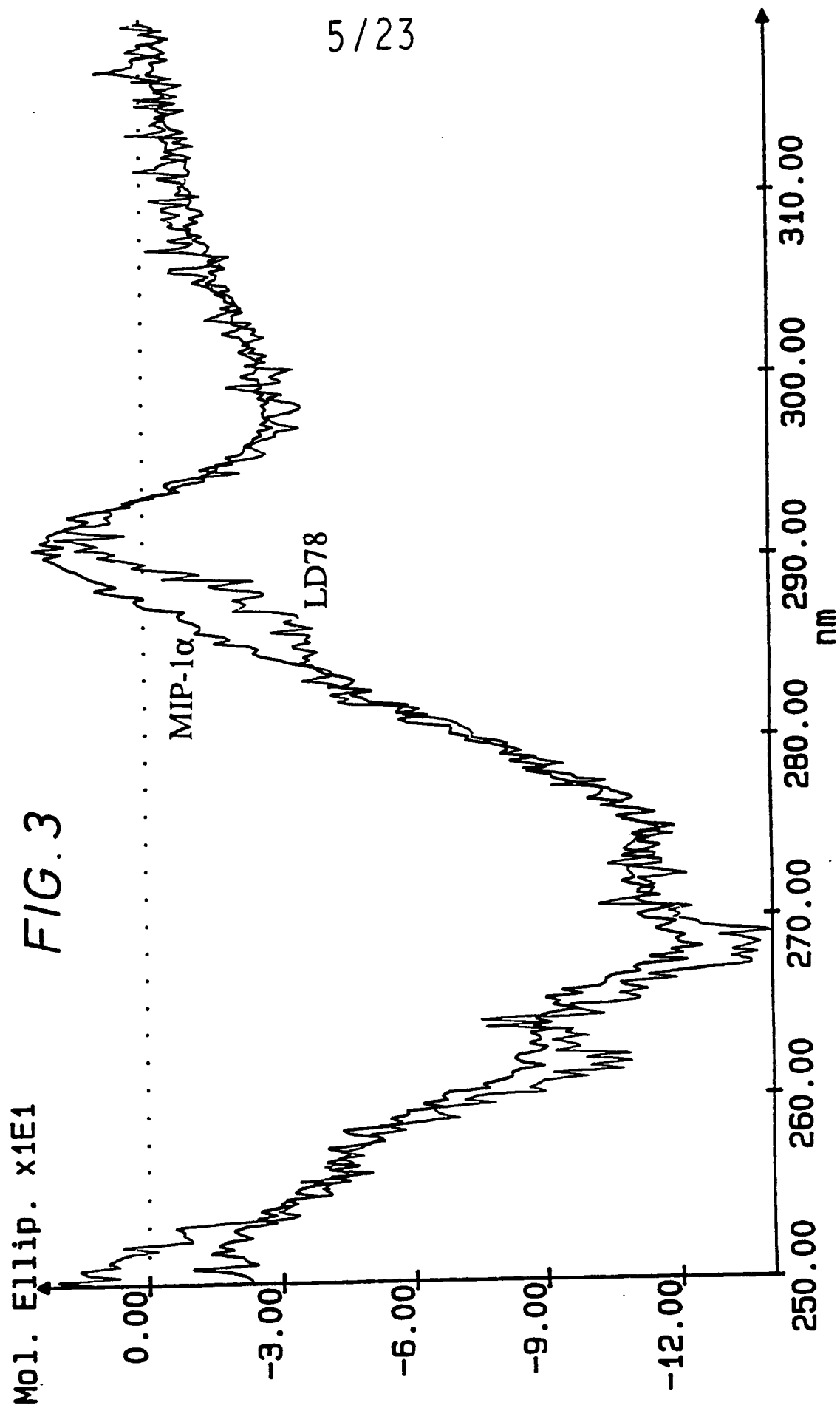
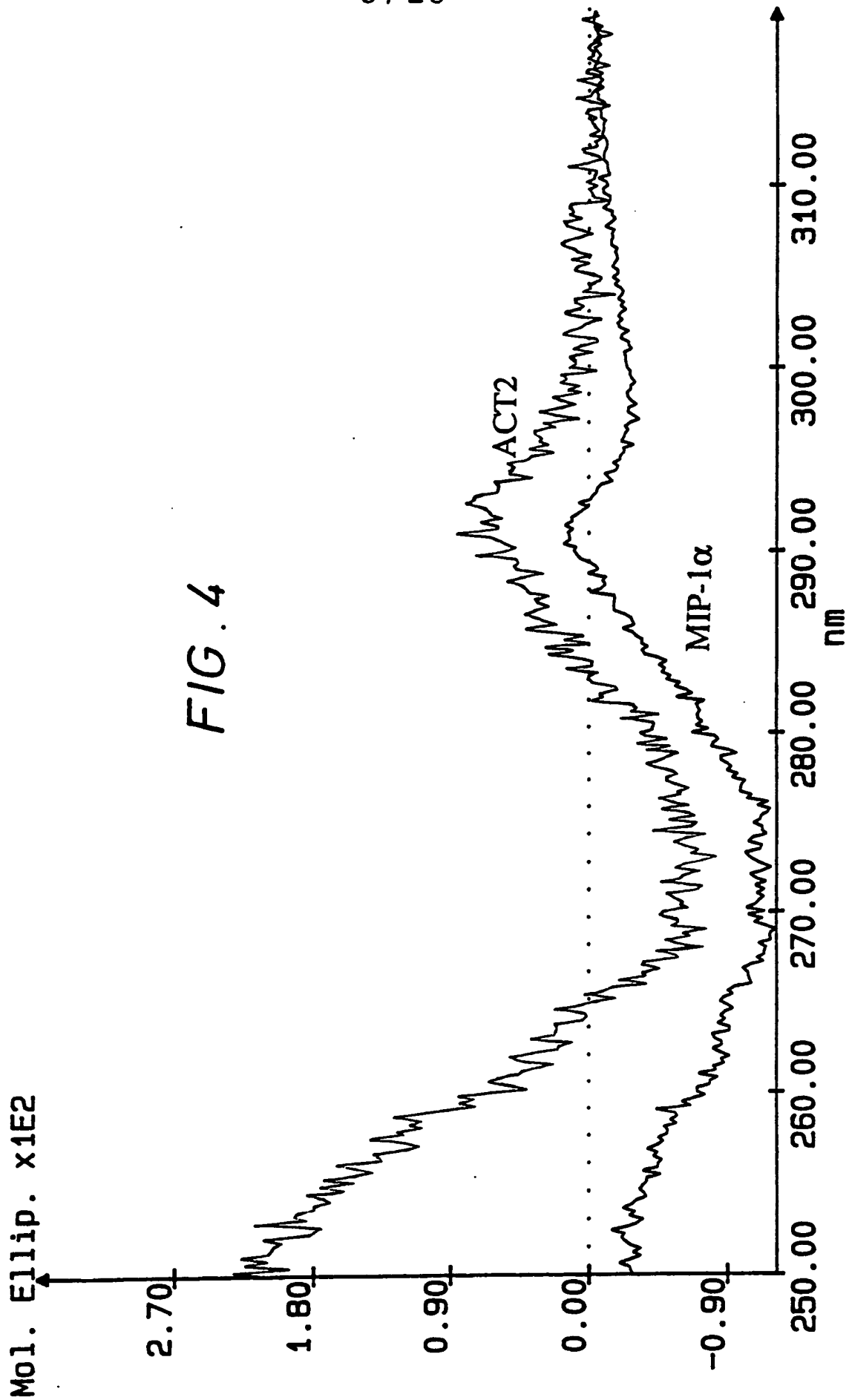


FIG. 2



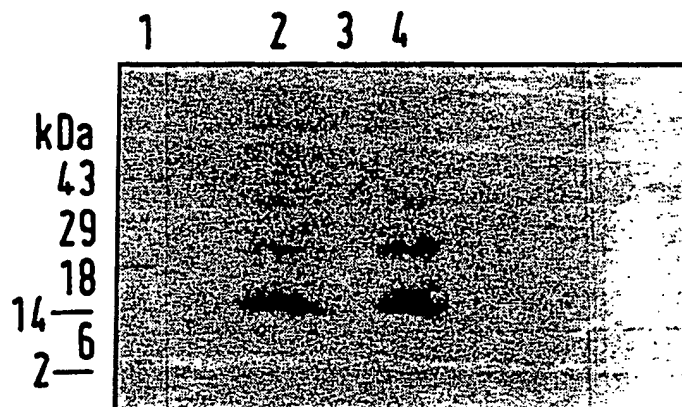




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FIG. 5

LANE	SAMPLE
1	markers
2	MIP-1a
3	Act-2
4	LD78



LANE	SAMPLE
1	EGF
2	MIP-1a
3	Act-2
4	Ld78
5	markers

FIG. 7

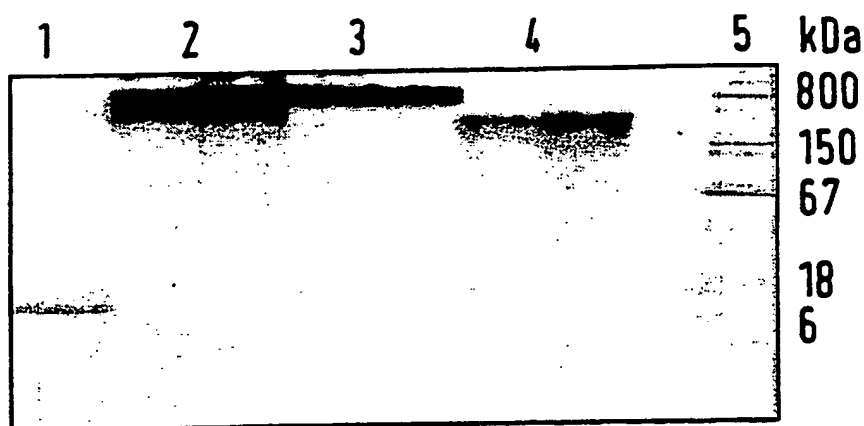
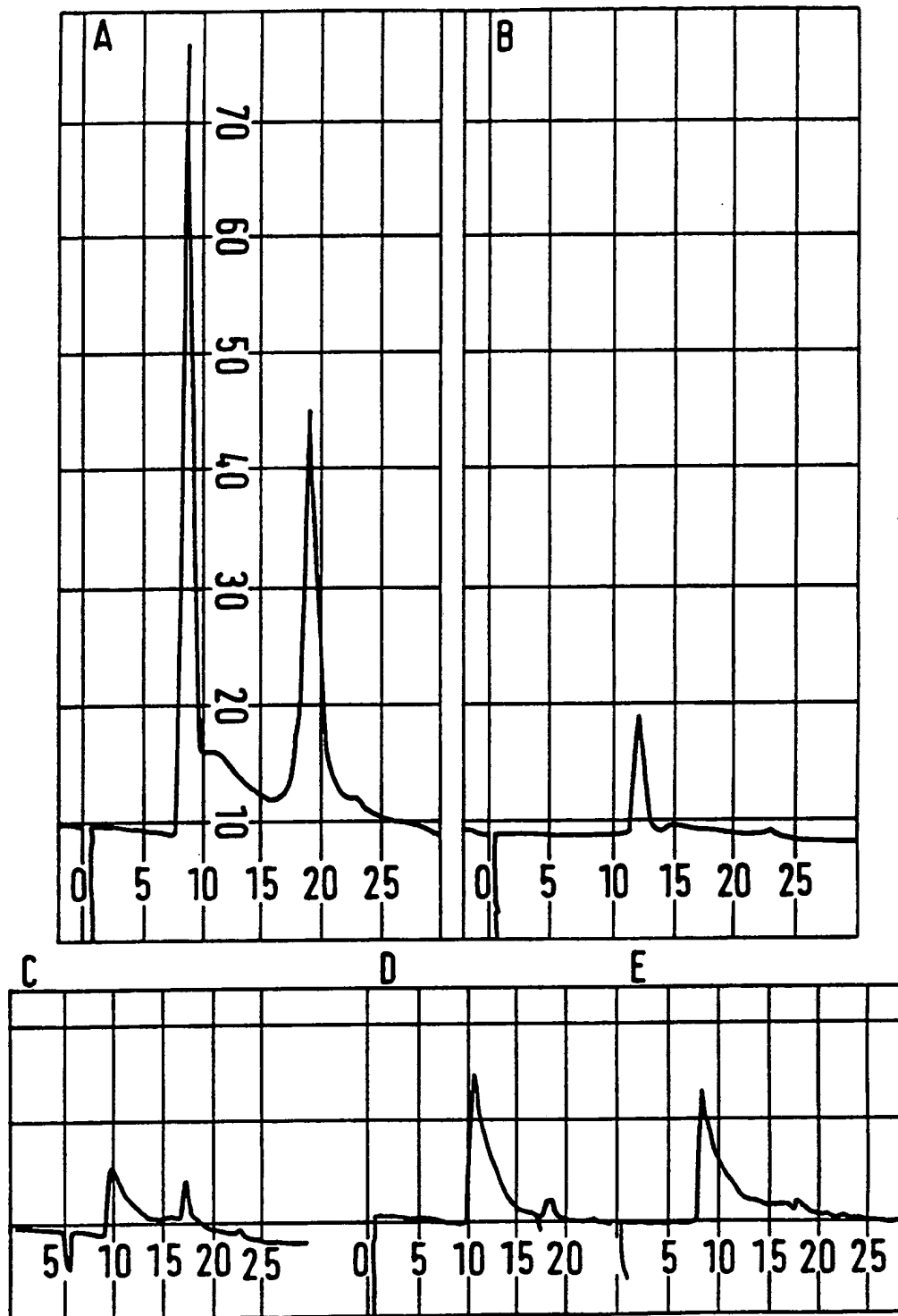


FIG.6



A	STANDARDS	
	BLUE DEXTRAN	2000kD
	LYSOZYME	14kD
B	ALDOLASE	158kD
C	MIP-1a	500-800kD
D	LD78	300-700kD
E	ACT-2	500-1000kD

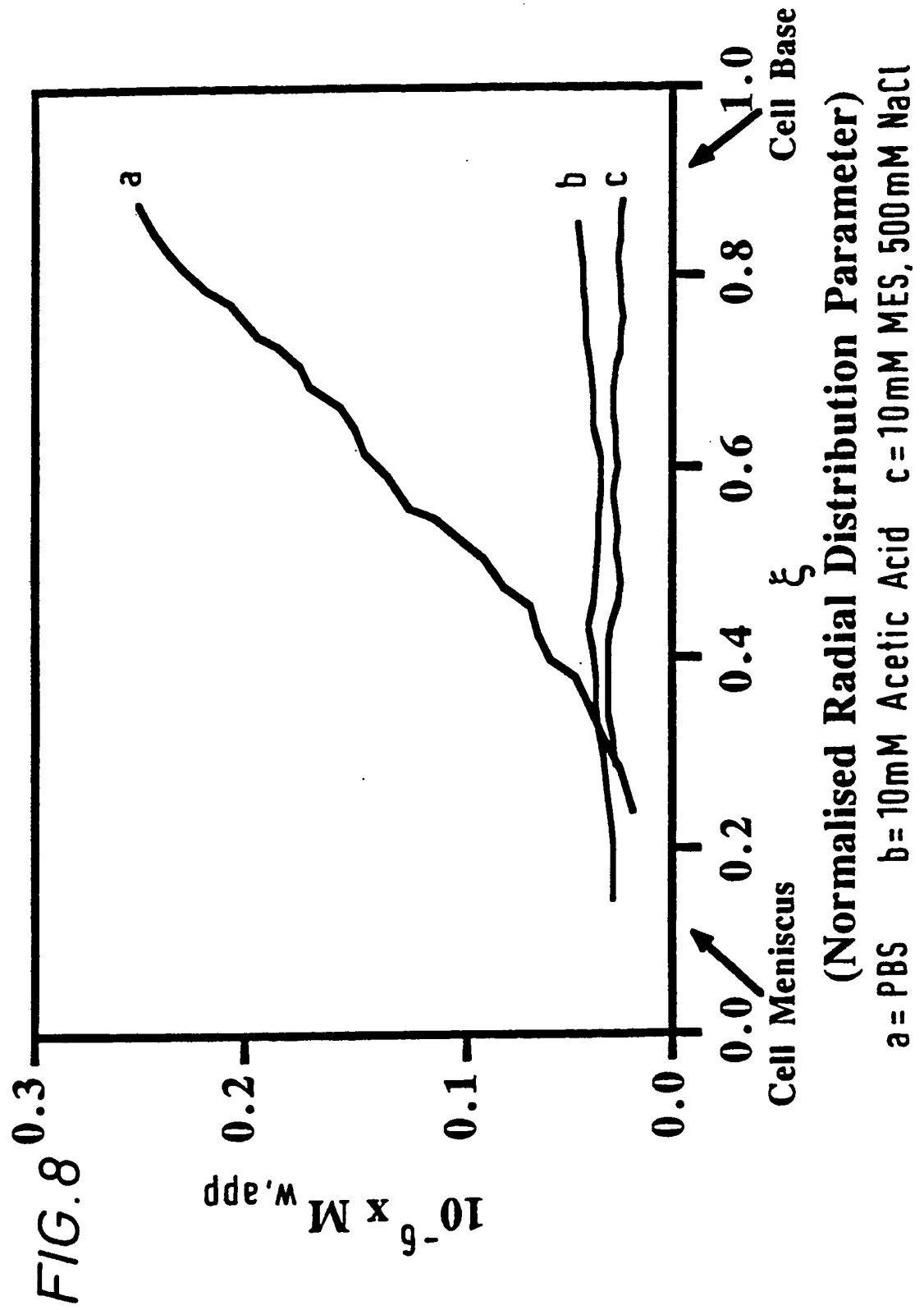


FIG. 9

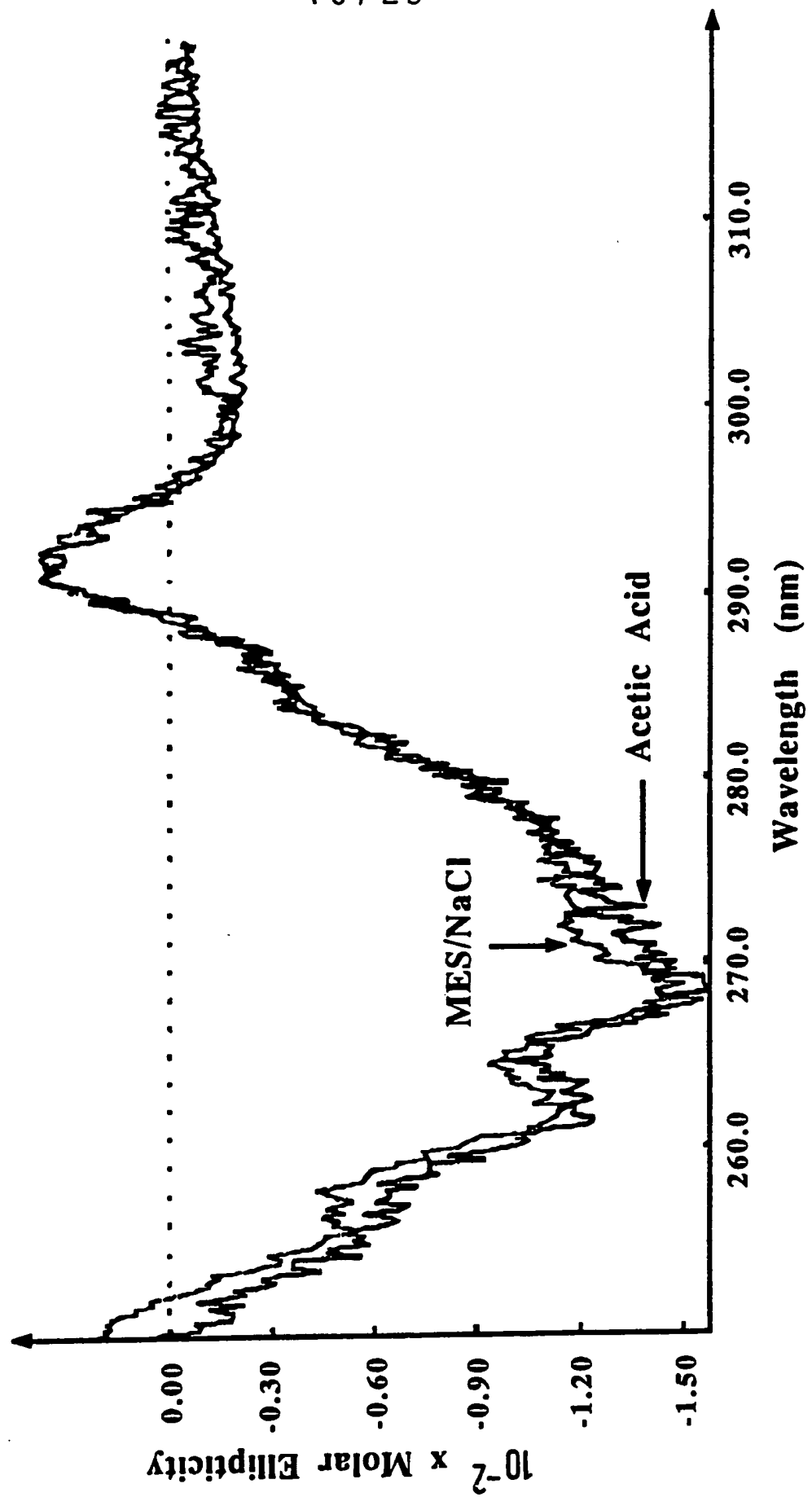


FIG. 10

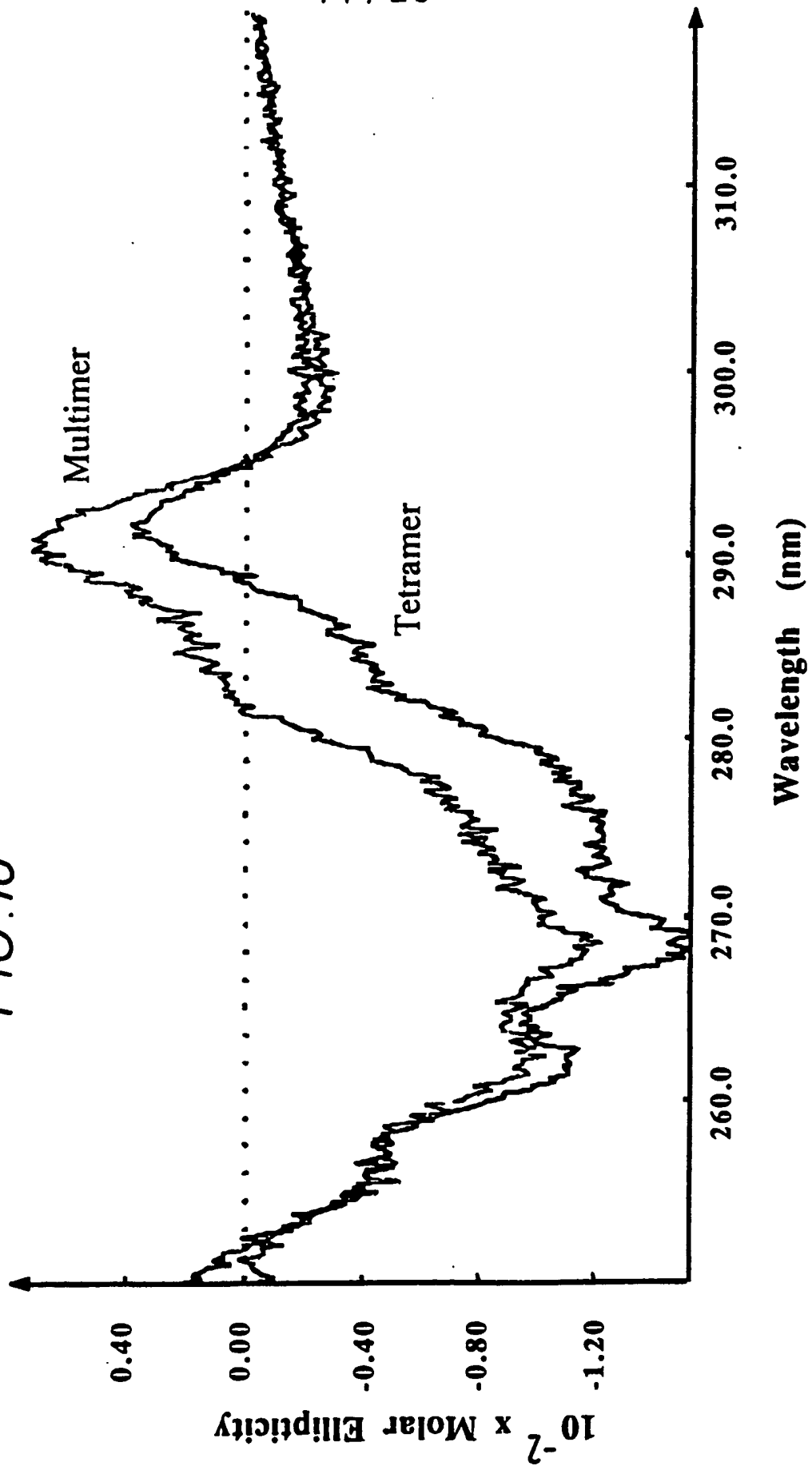


FIG.11

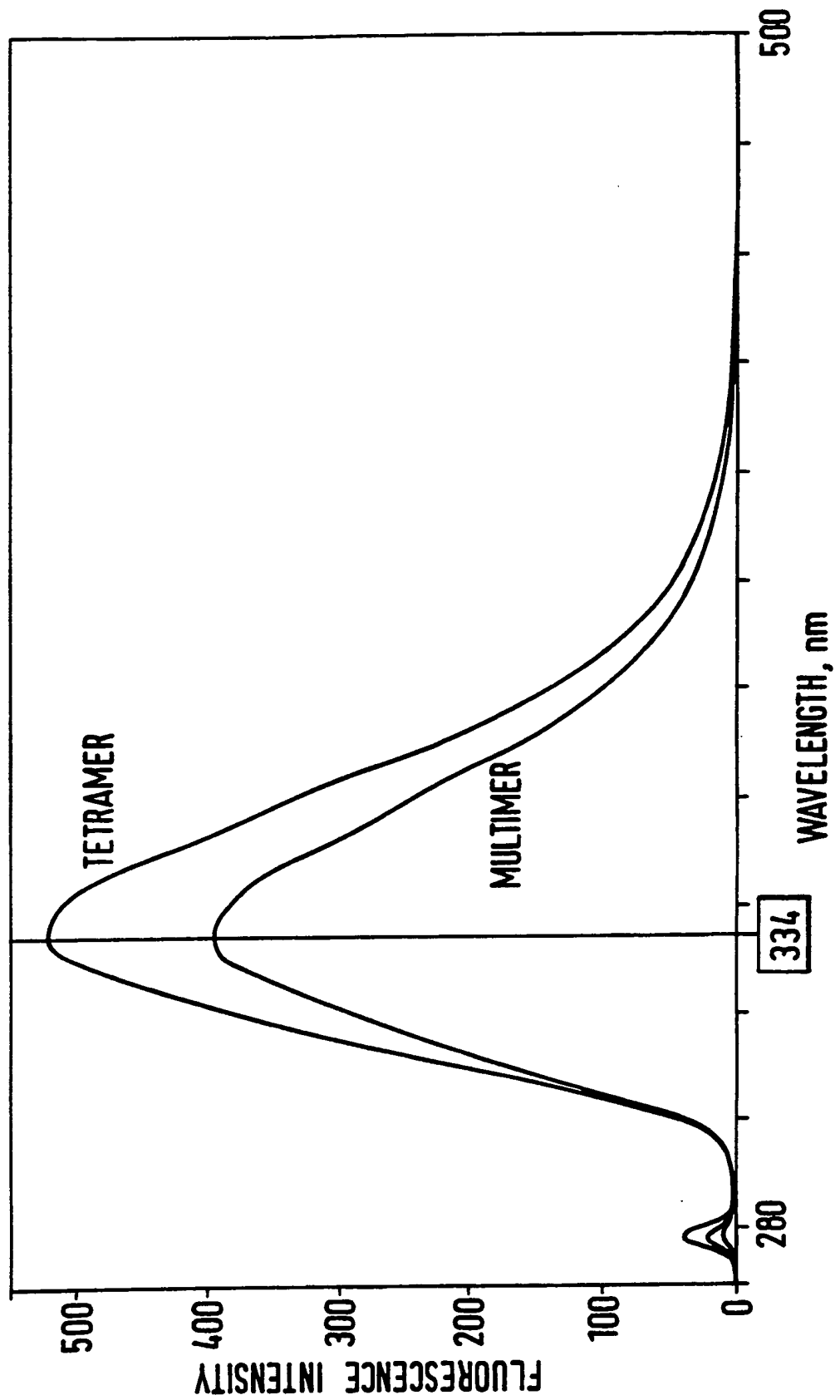


FIG. 12

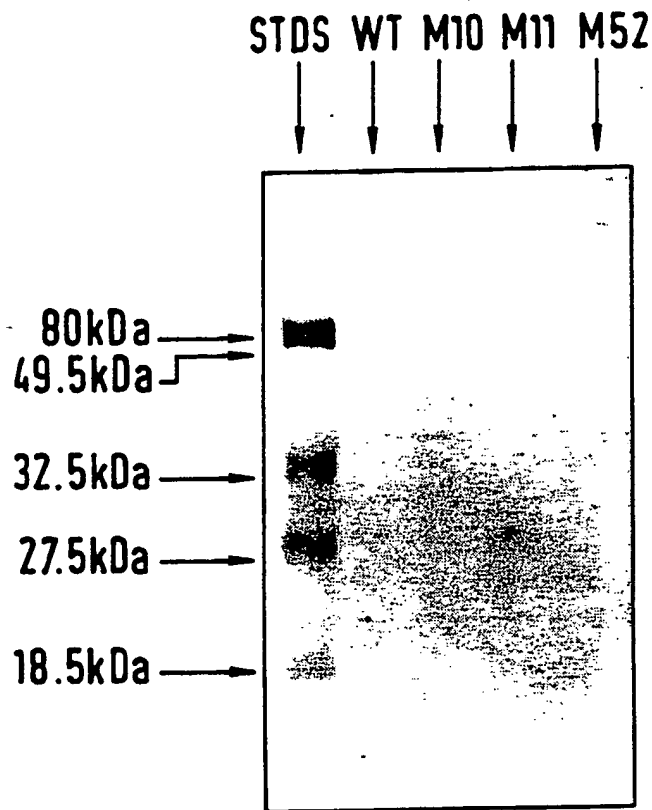
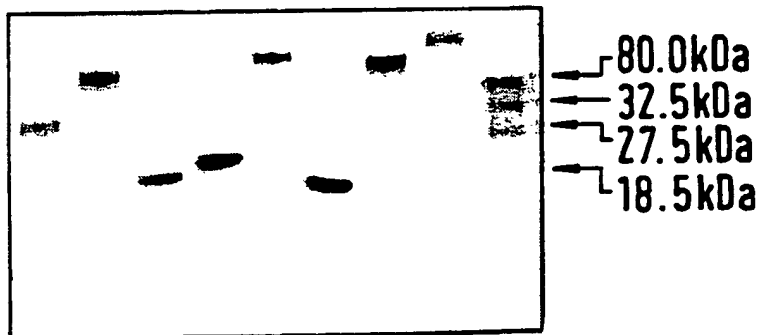


FIG. 13



Tracks from left
to right :

Mutant 30

Mutant 29

Mutant 26

Mutant 15

Mutant 10

Mutant 2

Mutant 1

Wild type

Markers

FIG. 14

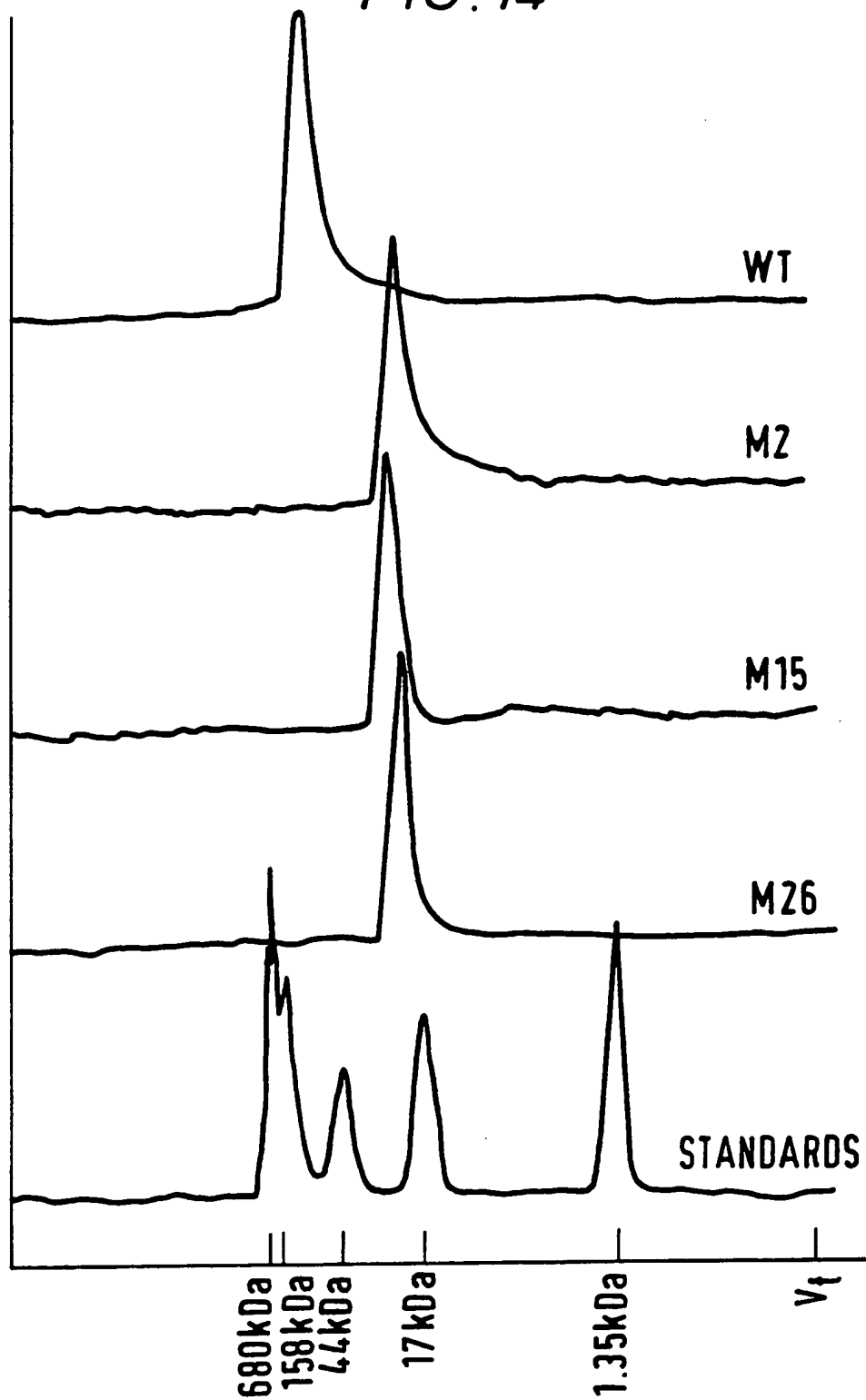


FIG.15A

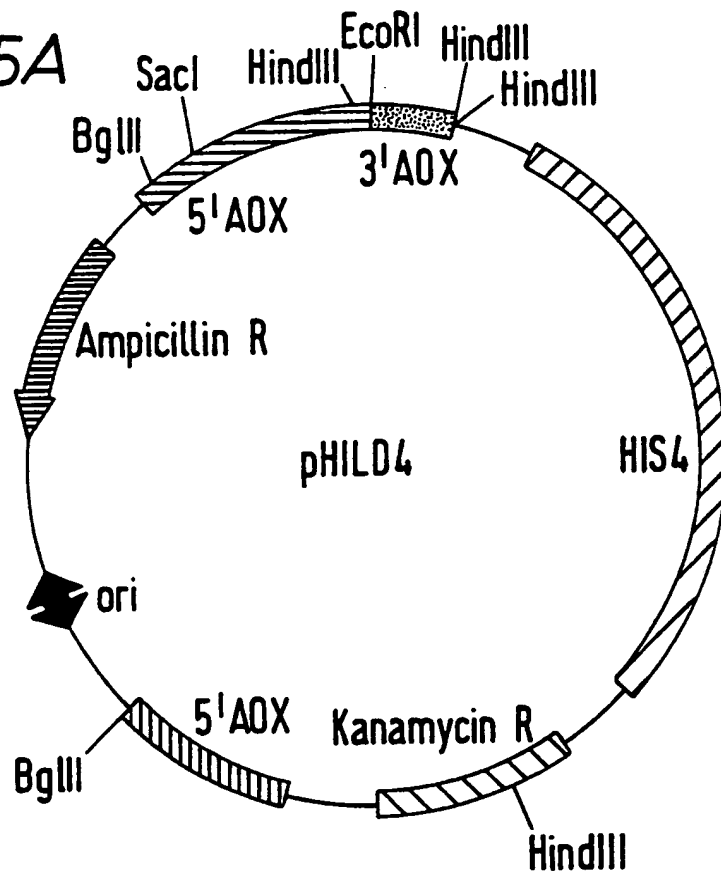


FIG.15B

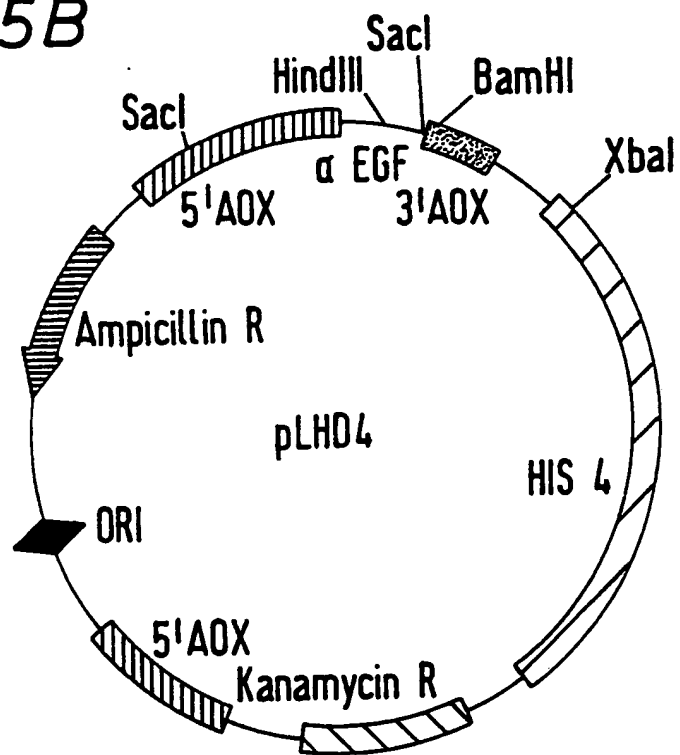


FIG. 16

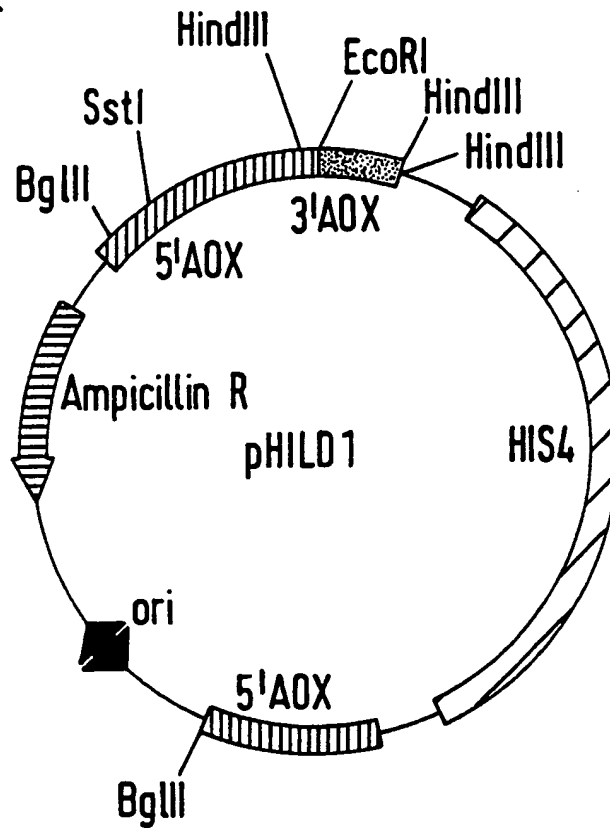


FIG. 17

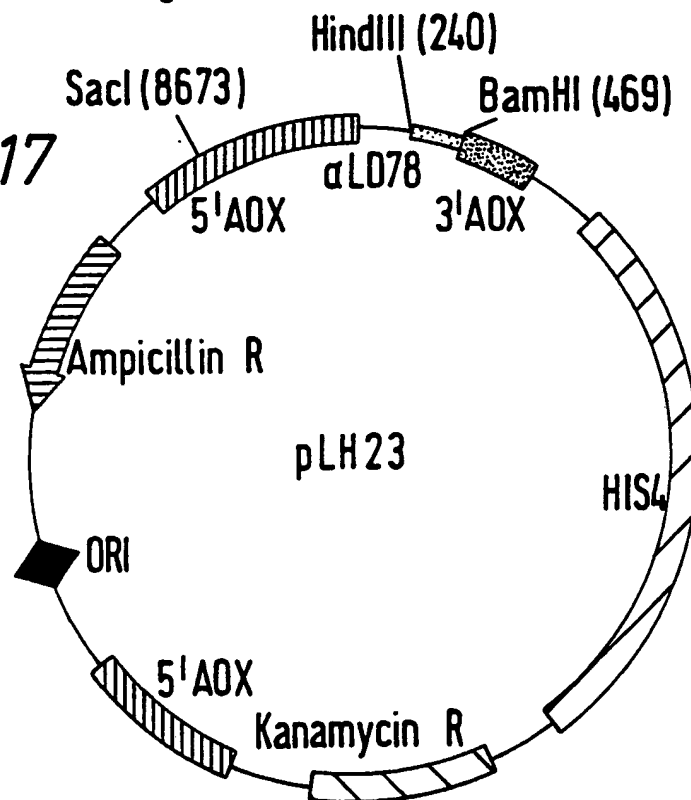


FIG. 18

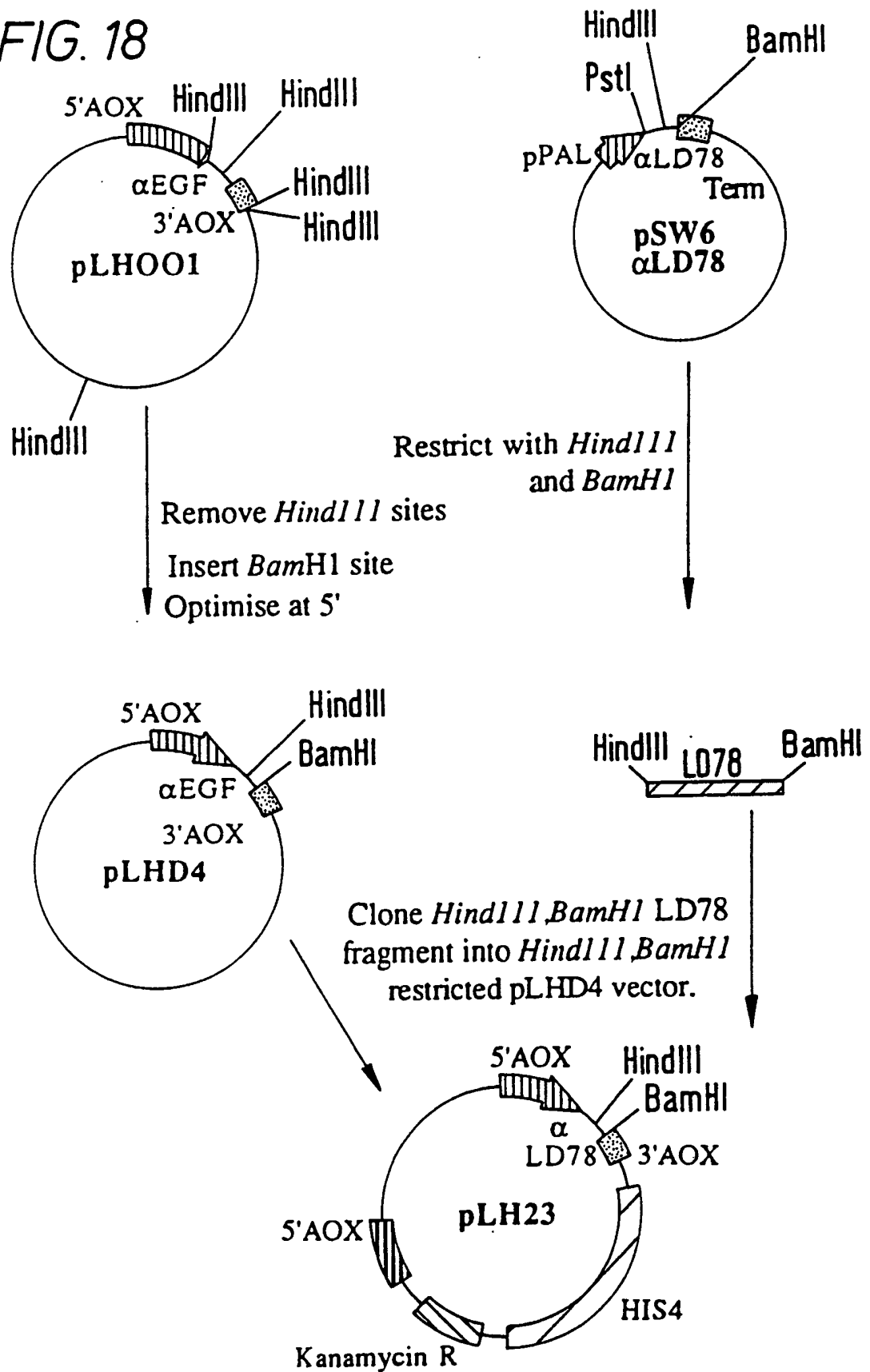


FIG. 19

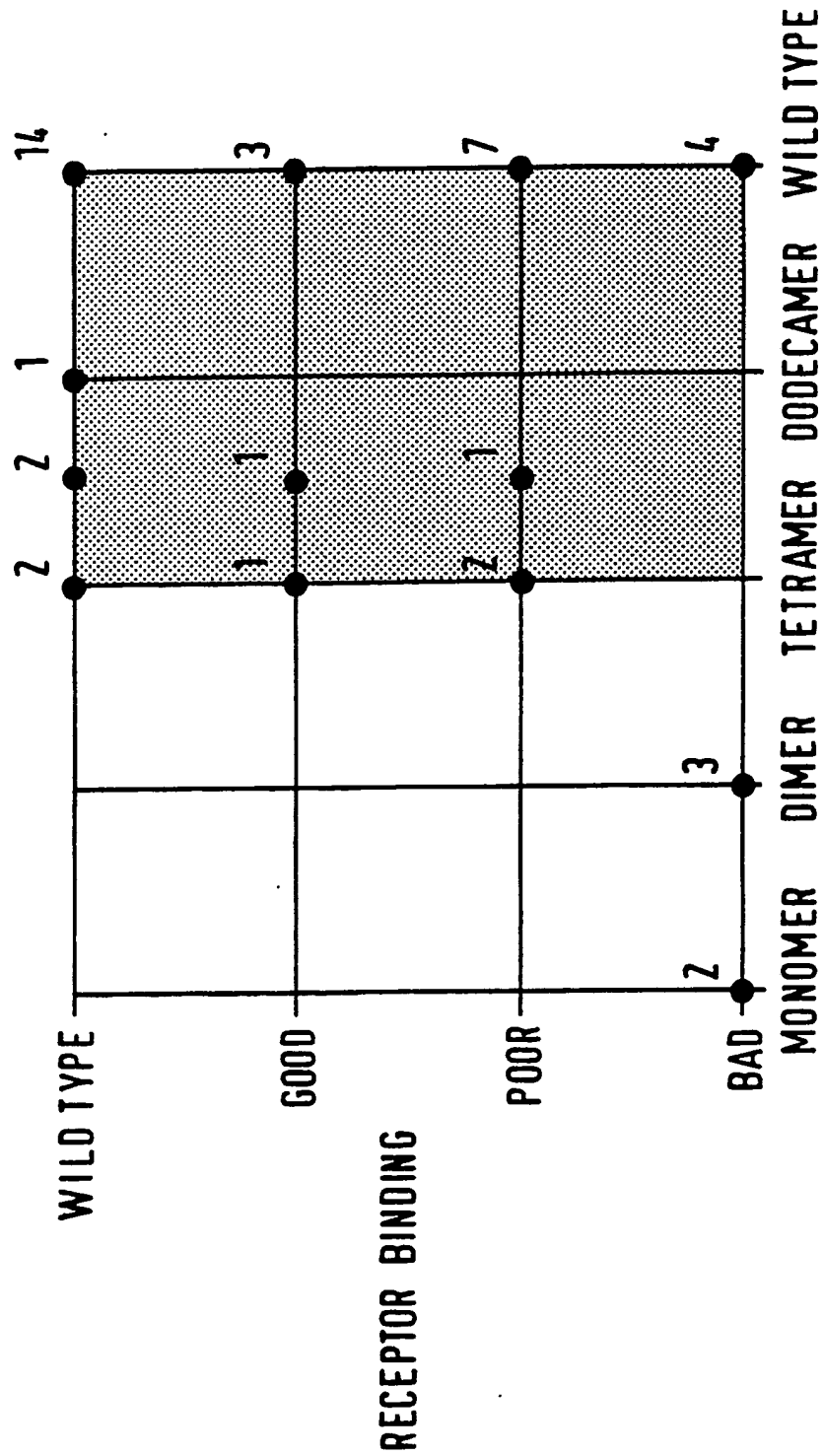
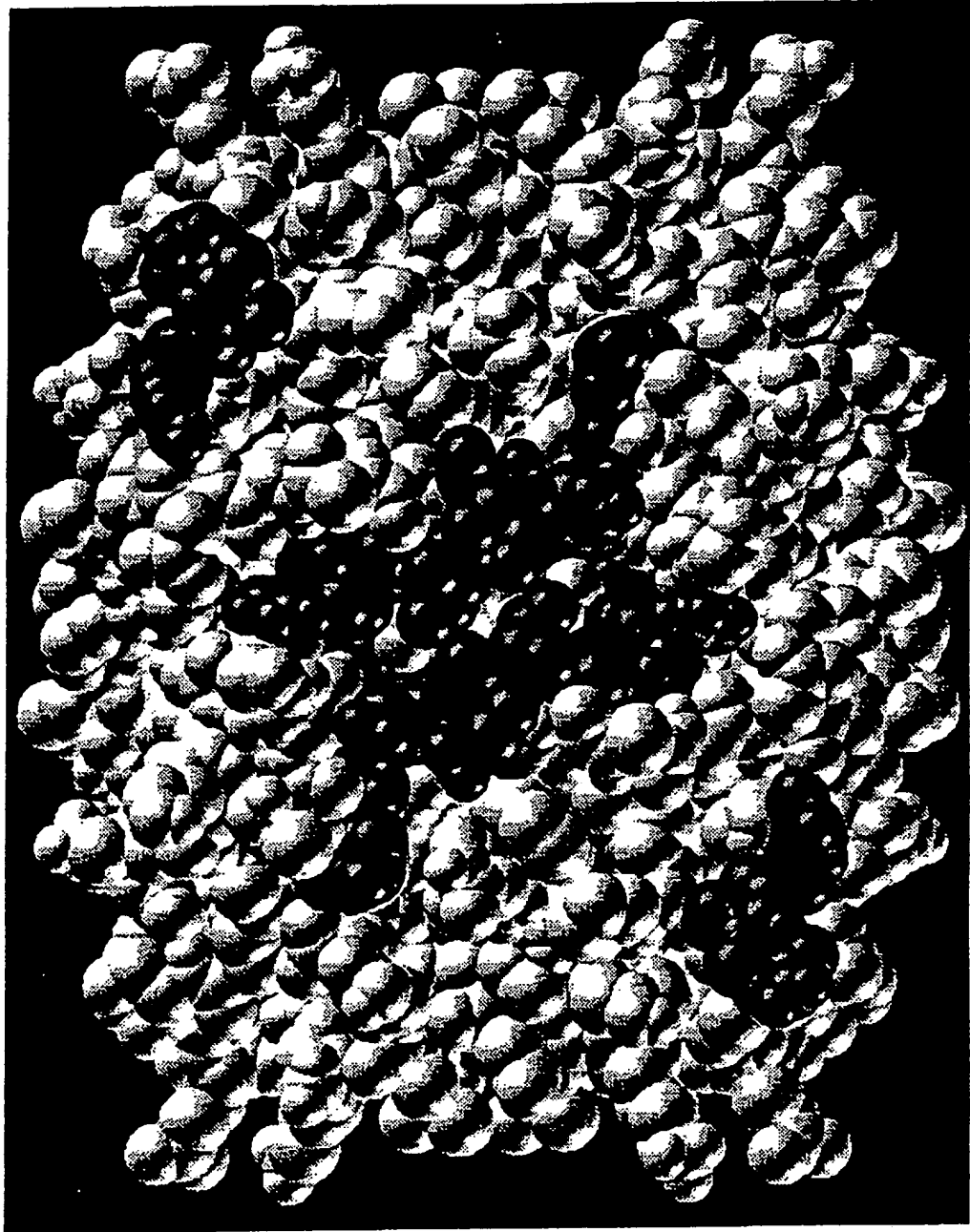


FIG. 20



20 / 23

BB5621

BB5619

BB5623

BB5624

21 / 23

21 / 23

FIG. 23

BB5424
AGCTTGAT AAAAGAGCAC CAATGGGTTT AGACCCCTCCA ACCGCAT GCT GCTTTTCTTA
||||| ||||||| ||||||| ||||||| ||||||| |||
ACCTA TTTTCTCGTG GTTACCCAAG TCTGGGAGGT TGGCGTACGA CGAA AAGAAT
BB5425
BB5426
CACCGCTAGG AAGTTGCCCTA GAAACTTTGT GGTC GACTAC TATGAGACCT CTTCTTTGTG
||||| ||||||| ||||||| ||| ||||||| ||||||| ||||||| |||
GTGGCGATCC TTCAACGGAT CTTGAAACA CCAGCTGATG A TACTCTGGA GAAGAAACAC
BB5427
CTCCCAGCCA GCTGTGGTAT TCCAAACCAA AAGATCCAAG CAAGTCTGTG CTGACCCGAG
||||| ||||||| ||| ||||||| ||| ||||||| ||| ||||||| |||
GAGGTCGGT CGACACCATA AGTTTG GTT TTCTAGGTTT GTTCAGACAC GACTGGGCTC
BB5429
BB5430
BB5431
BB5432
TGAATCC TGG GTCCAGGAGT ACGTGTATGA CTTGGAATTG AACTGATAAG
||||| ||||||| ||||||| ||||||| ||||||| ||||||| |||
ACTTAGGACC CAGG TCCTCA TGCACATACT GAACCTTAAC TTGACTATTG CTAG
BB5433

FIG. 25

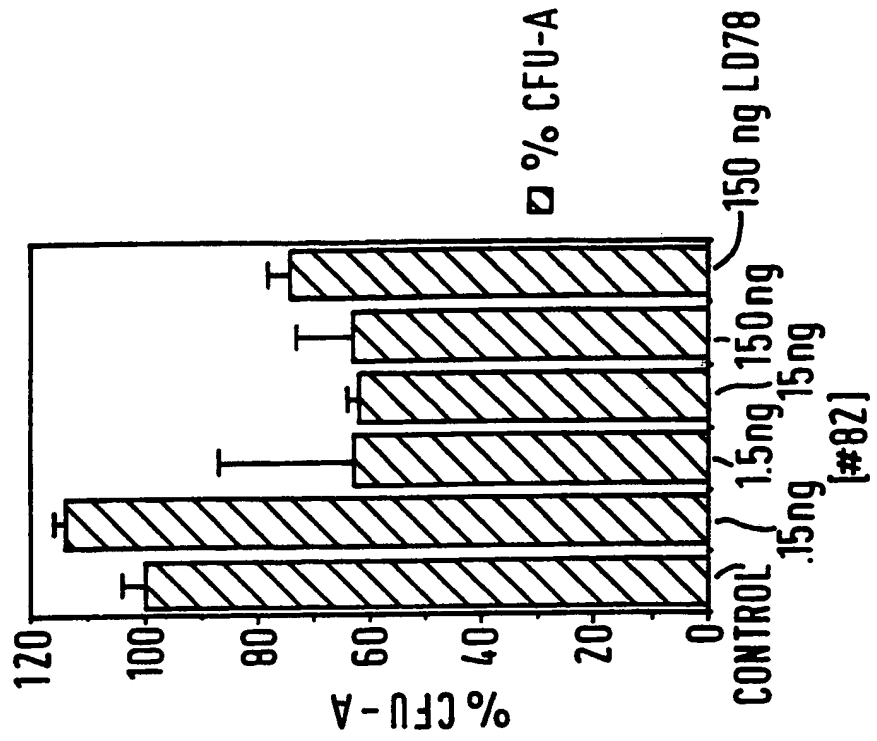
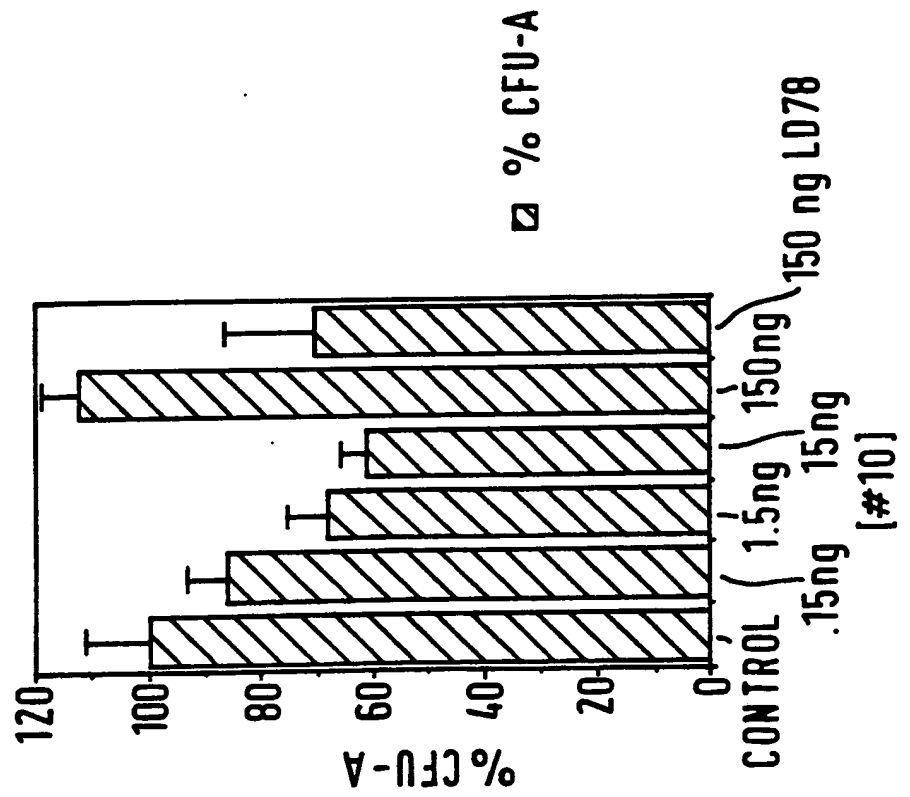


FIG. 24



I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC Int.Cl. 5 C12N15/19; C07K15/00; C12N1/19; A61K37/02		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	C07K ; C12N ; C12P ; A61K	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ^o	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	MOLECULAR PHARMACOLOGY vol. 38, no. 3, September 1990, pages 401 - 409 W.R.PAUKOVITS ET AL. 'Hemoregulatory peptide pGlu-Glu-Asp-Cys-Lys: A new synthetic derivative for avoiding dimerization and loss of inhibitory activity' see page 401, left column, paragraph 1 - page 402, left column, paragraph 3 see page 407, left column, last paragraph - page 408, right column, paragraph 2 ---	1, 2, 4, 5, 38, 39
A	WO,A,9 104 274 (GENETICS INSTITUTE, INC.) 4 April 1991 see page 7, line 1 - line 10 see page 23, line 1 - line 15 see page 23, line 22 - page 26, line 7 --- <div style="text-align: right;">-/-</div>	1, 29-34
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>^o Special categories of cited documents : ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search <div style="text-align: center;">11 MARCH 1993</div>	Date of Mailing of this International Search Report <div style="text-align: center;">24. 03. 93</div>	
International Searching Authority <div style="text-align: center;">EUROPEAN PATENT OFFICE</div>	Signature of Authorized Officer <div style="text-align: center;">MONTERO LOPEZ B.</div>	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	<p>Section Ch, Week 9147, Derwent Publications Ltd., London, GB; Class B04, AN 91-343166 & JP,A,3 228 683 ((KAGA) KAGAKU OYOBI KESSEI) 9 October 1991 see abstract</p> <p style="text-align: center;">----</p>	23,24
P,X	<p>WO,A,9 205 198 (CHIRON CORPORATION) 2 April 1992 see page 6, paragraph 4 - page 7, paragraph 1 see page 13, paragraph 2 - page 15, paragraph 1</p> <p style="text-align: center;">-----</p>	37

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

GB 9202390
SA 68542

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO-A-9104274	04-04-91	CA-A- 2064558	26-03-91
		EP-A- 0494268	15-07-92

WO-A-9205198	02-04-92	None	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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